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The Use and Misuse of Sulphonamides

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It would appear to be rather late in the day to find it still necessary to impress upon practitioners the fundamental premises for the use of sulphonamide drugs. As I go about my daily practice I am so continually impressed with the fact that many of my colleagues are actually misusing these drugs, or are prescribing them without any reference whatever to the facts ascertained by experimentalists, or to the experiences of clinicians in the field. It is commonplace nowadays to hear qualified and unqualified alike saying, "*they have given 'M. & B.' which proved valueless*," though in many cases they obviously have not known what "M. & B." really was. They seem not to grasp that "M. & B." is a mere abbreviation of May & Baker, and does not indicate which of the various chemotherapeutics prepared by that or other firms has been employed. Actually the term "M. & B." has been regarded in medical circles as synonymous only with sulphapyridine and with no other compound. This, however, is the most toxic of the group and has largely fallen into disuse in favour of the less toxic and probably equally efficacious sulphathiazole, sulphadiazine or the new compound sulphamerazine.

What is of equal importance is that some of these delinquents have obviously not the slightest idea, in a given case, of the identity of the organism responsible for the illness; and it seems highly probable that even if they *did* know, their knowledge of chemotherapeutics would be so limited as to leave them without any idea as to which of the compounds should be selected for its greatest specific action. Two days ago a colleague proudly proclaimed that he *always gave* "*M. & B.*" to cats suffering from specific enteritis. He did not claim cures, however, and certainly seemed quite unaware that sulphonamides were generally believed to be valueless against virus infections. At a recent Divisional meeting I heard a member reciting his treatment of a dog which had a swollen foot. He had given it "M. & B." without any effect whatever. One wondered what effect he really expected, and one felt amazed that a qualified man should treat a valuable mode of therapy with such unenlightened flippancy. People should really get rid of the idea that so-called "M. & B." cures, and can quite properly be prescribed for all and sundry ailments, irrespective of aetiology. It is a pure waste of time and money, an exposure of ignorance and a procedure calculated to bring chemotherapy into undeserved disrepute.

Veterinary surgeons are not alone to blame, for I have heard of the most amazing instances of ignorance on the part of general medical practitioners, the most glaring of which was perhaps the prescribing of sulphanilamide to a patient suffering from chicken pox.

A direction in which some of our members probably err most of all is in connection with dosage. They fail entirely—in many cases—to realise that the essence of the treatment is (1) early administration; (2) the rapid attainment of an adequate blood concentration of the drug (10 mg. per 100 c.c.), and (3) the maintenance of that concentration until the temperature has been normal for 48 hours. Laboratory workers have established the dosage per 1 lb. body weight necessary to maintain this blood concentration, and posological information is available to all practitioners. Thus one can only surmise that many of them never trouble (or have not the time) to read current literature; or having read it, fail to assimilate it. How else could one explain the prescribing of one sulphapyridine tablet twice in 24 hours for an Alsatian weighing nearly 100 lb.? This came to light recently in a case to which I was called for a second opinion. The animal's very high temperature had never been reduced after five days of this "footling" treatment, and I came to the conclusion that the infecting organisms had by then become resistant to the bacteriostatic effects of the drug. Totally inadequate dosage of this kind has come to my notice in many previous cases, and it must be condemned absolutely; for not only is it valueless but it would most likely induce a condition in the patient of permanent resistance to sulphonamide drugs. Indeed, there is a grave possibility of inducing an agranulocytosis in patients which have been subjected to this medication for too long a period.

I am not posing—by any means—as an authority, but apart from my own clinical observations, I *do* read and assimilate the literature, and do my best to follow the fundamental principles of any particular line of treatment adopted. Fortunately, no doubt it is only a small minority of my colleagues who err in this way, and if this note is instrumental in causing them to revise their methods and contemplate the subject more earnestly, then something of value will have been achieved.

Sulphonamides in General Veterinary Practice

DISCUSSION BY THE CENTRAL VETERINARY SOCIETY

(*Continued from page* 233)

General Discussion

Mr. L. G. ANDERSON: He was invited to speak at short notice, and had not had an opportunity to prepare a paper. What he had to say concerned his experience of such sulphonamides as he had used in the field.

Many of the newer types were not yet available to practitioners, while, being extremely difficult to produce, those that were available to them were very expensive and afforded only limited opportunities to practitioners to gain experience of their use in the field.

They had heard much about what the sulphonamides *would* do, but he wondered if it was not a good idea to consider for a moment what they would *not* do, to try and retain some sense of proportion. The alchemists of old were always looking for the "philosopher's stone" and while we people in these modern days laughed at the notion, we were nevertheless still looking for it; we still tried to turn any new therapeutic agent into the complete panacea for all the ills that had ever been. If one scrutinised the literature of the last few years one would find references to one or other of the sulphonamide drugs being used for practically every type of disease in man and animals. That was a great pity. Advances in chemotherapy had been of great help to them all, but they must learn the limitations of these drugs and know something about the dangers attending their use. Let them see, therefore, that they used the sulphonamide drugs in suitable cases and not simply applied them to anything and everything. Those who were in practice, moreover, were occasionally forced to look for something to use when they could not think of anything else, and the sulphonamides had been very useful to them in that respect. It was perhaps fortunate that the economic factor—for these drugs were very expensive—had prevented the veterinary profession from overstepping the mark to quite the same extent as had the medical profession, but even so, particularly in recent years, he thought they had been using the sulphonamides far too often and when there was really very little indication for their use.

He did not think the indications for sulphonamide therapy in veterinary medicine were so common as they were in human medicine. In his view, results were often attributed to their use which were undeserved, *e.g.*, in the acute forms of mastitis one frequently got a clinical cure, but before they knew anything about the sulpha compounds these cases were successfully treated by the farmer by hot fomentations and careful stripping of the udder. Again, in pyrexia in horses, they now used prontosil, but when horses ran a high temperature in the old days it often dropped just as rapidly with the administration of liq. ammon. acet. or other antipyretics.

He was glad that Dr. Brownlee mentioned the existence of resistant strains developing as the result of inadequate dosage, because he thought that was a grave danger, particularly when it came to the question of the layman using those drugs which he could buy over the counter.

Nevertheless, the fact that he seemed to have been going "all reactionary" for the last few minutes did not mean that he had no faith in sulphonamide therapy. Sulphanilamide was the cheapest and most readily available agent of the sulphonamide group and therefore the one most commonly used in veterinary practice, but it was not altogether a satisfactory drug from the dispenser's point of view because it was almost insoluble in water. Moreover, because of its bitter taste it was not an easy drug to administer in powder form; hence the development of a large number of other forms. Mr. Barrett's suggestion of giving the initial dose to horses by means of the stomach tube was a good one, but because the powder was insoluble one wasted a lot of it in the bucket or jar. The electuary, however, was quite useful. He thought the result of giving the powder in mash or food was very unsatisfactory; in fact, putting it in a horse's food usually prevented his eating it at all. Therefore he gave the initial dose in one of the soluble forms intravenously and followed it up with doses given in electuary or emulsion.

Mr. Barrett had covered the ground of the powder form and sulphonamide L.S.F., so little need be added with regard to them. There were other soluble forms worth mentioning. Sulphonamide EOS was readily soluble—he believed about 1-2. That was quite useful in the intra-mammary treatment of mastitis. Soluseptasine was also a very good product in both horses and cattle: he thought the solubility was about 20 per cent. The initial dose in the large animal was up to about 80 c.c., given intravenously, followed by the usual doses *per os*. Among these soluble forms they should not overlook Bayer's prontosil; in horses with respiratory troubles it was better than any of the drugs they had had recently. A recently developed form was solupyridine, a May & Baker product, which was a 45 per cent. solution of sulphapyridine and which, it was suggested, should be used for mastitis. He obtained a quantity of this compound and used it on a number of cases. He kept careful records, having the organisms typed and the milks examined after treatment. The results in chronic streptococcal mastitis in dry cows were very disappointing, but he was very surprised to find that in a number of cases of staphylococcal infection of the udder it seemed to do a lot of good. In mild cases one got both clinical and bacteriological cure, and in severe cases in which one normally would not have been surprised to lose the animal, a very rapid recovery occurred; though the affected quarter was lost, the animal yielded well in the other quarters. The "snag" about the use of the soluble forms of the sulphonamides in mastitis was that they did not remain in the udder in concentration for very long, owing to rapid absorption. Promising results had been yielded by sulphanilamide in oil, but unfortunately this was not now obtainable.

He had used sulphanilamide in adult pigs for respiratory affections with very good results, making it up in the form of an electuary. He had no knowledge of the action of the sulphonamides in sheep—probably the cost was prohibitive. They got so many infectious conditions in calves associated with such a variety of causal organisms that one became chary of boasting about results. For navel-ill of foals, however, one obtained good results, in combination with Bayer's yatren vaccine, if one took them early; also with sulphapyridine. In calf pneumonia sulphapyridine was very useful.

With regard to calf diphtheria, he did not think he knew the disease. He saw a number of cases in which necrotic areas developed between the jaw and the lip, and if small doses of sulphapyridine were given and the lesions curetted, good results were obtained.

The advantage of external application was that there was a great concentration of the drug at the point of infection, hence its value in wounds of large animals, particularly in teat injuries, such as the frequently occurring tears from barbed wire. In such cases one simply cleaned up with saline, sutured if necessary, dusted well with sulphanilamide powder, and applied a narrow elastoplast bandage, leaving it on for a fortnight. On removing the bandage one was usually very gratified with the result. It must be remembered, however, that sulphanilamide did not work too well in the presence of pus or tissue debris; thorough cleansing-up was necessary.

Mr. Barrett had mentioned the use of sulphanilamide in body cavities, but he would suggest caution here, because he believed that in the ordinary way it was not a sterile product and there had been a good deal of trouble in human surgery when it was first used in body cavities. Mr. Barrett also referred to rumenotomy suture trouble: he had recently had the same experience—everything looked marvellous for four or five days, but he often found a terrible sloughing underneath the sutures which he thought was due to the inevitable pressure of the sutures. Sulphonamides were of very doubtful value in preventing this trouble which was usually associated with *C. pyogenes* infection. Sulphanilamide had very little action against *C. pyogenes*, and was useless in summer mastitis, but sulphapyridine was of value. One other condition in which sulphanilamide was used quite commonly in cattle was in foul of the foot, in which the usual organism was *B. necrophorus*. Its action was doubtful but in serious cases where amputation of the digit was resorted to, it made a good after dressing.

Major Leslie Pugh: Having listened to Dr. Brownlee's paper with great interest, he was going to try and forestall his criticism by admitting that he had a failing which he believed was not so very uncommon, of running certain lines of thought and treatment rather to extremes for a period of time and then gradually dropping the unsuccessful lines—instead of paying more attention to the suggestions and cautions made by the laboratory workers when advocating new drugs to the profession.

Some years ago he viewed almost every dog as an endocrine subject and treated all and sundry with glandular products; but after a time he became more critical and ultimately was able to recognise a few definite syndromes for which he could prescribe a rational line of treatment. He now admitted that the same thing had happened as far as he was concerned with sulpha therapy. In the early days he had used Prontosil on almost every type of infection not only by injection but also by topical application. However, one good thing did come out of all this empiricism—he established to his complete satisfaction that the topical application of Prontosil very considerably aided the overcoming of those infections susceptible to this form of therapy—and so when sulphanilamide was first introduced he immediately used the drug topically as well as by other routes with the most pleasing results. He had now reached the stage of having formed some general principles, based on clinical experience in canine practice, which tended to confirm the findings and suggestions of laboratory workers and other clinicians in the following respects.

Firstly he found that the sulphonamides gave their most spectacular results when used in acute cases, and that the longer or more chronic the case the slower was the response.

Secondly, he agreed with the previous speakers that it was imperative to raise the blood concentration early and maintain it there for an adequate length of time. It was bad practice to give just a few doses and to stop immediately the temperature fell.

Thirdly, he thought it absolutely essential, especially in dogs and cats, that a large fluid intake should be maintained during the administration of the drug.

Fourthly, he did not use sulphonamides to the exclusion of other well-tried treatments such as autogenous vaccine and the curetting of infective granular tissue, etc. He thought it might be taken as a general rule that in dealing with a localised infection, the more chronic the case the more active must be the local surgical interference.

In regard to toxicity, he believed that sulphonamide and sulphathiazole were the best drugs to use in the dog. Following the use of sulphapyridine he had seen a good deal of vomiting, salivation, ataxia, depression and anorexia. He was surprised that more cases showing toxic symptoms were not seen in canine practice, when one considered how common chronic nephritis was in the dog.

Clinically some of the most spectacular results were seen in the treatment of respiratory infections in dogs, especially in acute tonsillitis. The drug of choice in these cases was probably sulphathiazole, but many responded rapidly to sulphanilamide. Although many of the infections complicating canine distemper responded to sulphonamide treatment, none of the sulpha group appeared to have any action on the virus and did not prevent the nervous sequelae from developing. Neither do these drugs prevent nor cure the nervous phenomena of infectious encephalomyelitis of dogs.

Sulphonamide treatment was most useful in the prevention and treatment of acute puerperal infections, but in chronic endometritis the results were poor. Soluseptascine was a useful preparation in those cases complicated by vomiting. Sulphonamides were a great aid to the treatment of acute abscesses, associated with a good deal of cellulitis, such as one not infrequently encountered in the anal region of the dog. Chronic anal infection of the dog was a difficult condition to deal with but of recent years a most satisfactory technique had been evolved consisting of the filling up of the anal glands with a sulphapyridine paste—the preparation being introduced with the aid of a special syringe made for the purpose.

He agreed with Mr. Barrett that the application of sulphonamide subcutaneously to all wounds likely to be contaminated during an operation was very sound, and he said that the majority of his surgical cases were so treated in spite of the fact that the sulpha preparations were said not to be sterile. After the removal of foreign bodies from the intestine, he swabbed out the lumen of the bowel and packed in dry sulphapyridine before suturing with most satisfactory results.

Before concluding these somewhat sketchy observations based on clinical experience, he would like to say how much they, as clinicians, appreciated the work that had been done, as well as that now being done on this subject, by their veterinary and medical friends in the various research institutes and colleges. Also, in spite of his somewhat flippant observations on empiricism, there was no one who appreciated more the help of the laboratories in their great work. He was sure they all hoped and trusted that their labours might eventually lead to the evolvement of further agents against those other infections, such as brucella, which scourged our animals and bring them, also under control. They wished them every success in their labours.

Major H. Kirk: He thought Dr. Brownlee had said, "It does not matter about the dose." Doubtless Dr. Brownlee was speaking in a general way, but he (Major Kirk) would not like it to go out to the practitioner that the initial doses were unimportant. If you gave an inadequate initial dose you failed to get an adequate concentration in the blood, with the likely consequence of bringing about the condition known as drug resistance. Thus they must bear in mind, in treating cases with an agent of the sulphonamide group, that adequate doses must be given. [Dr. Brownlee: "I am sorry I have been a bit obscure about that."] Did Dr. Brownlee know of any method whereby drug resistance, once established, could be overcome? "Quacks," and other people too, were giving M. & B. for everything.

In one of the tables exhibited by Dr. Brownlee it was shown that sulphaguanidine was rather ineffective in bowel infections: he led them to believe that that agent had rather fallen from grace in the treatment of bacterial infections of the bowel. He (Major Kirk) had tried sulphaguanidine and succinyl sulphathiazole against coccidiosis in cats, also sulphanilamide against infectious feline enteritis, without result. He might have expected that; but it might cure microfilariasis. In his experience all the sulphonamides were useless in canine distemper, though for the secondary infections they seemed to be valuable. However, he had an outbreak of distemper amongst his cats, and gave them sulphapyridine, having only one death out of 30, which he thought was rather good. Therefore, now when he encountered pneumonia or other lung troubles in cats he gave sulphapyridine.

He believed that none of the sulphonamides would touch the acid-fast organisms. Was promin a sulphonamide or not? It was available from the Parke Davis laboratories and was stated to kill acid-fast organisms if brought in actual contact with them. He suggested that if that was the case, it might be useful in tuberculous mastitis.

As regards the toxicity of sulphapyridine, a gentleman in that room had told him of a case in which a greyhound knocked a box of 100 tablets on to the floor and ate the contents, sustaining no ill effects.

Prontosil he had always found excellent in cystitis, but owing to the staining properties of the solution he had now given it up for an injection of soluseptasine, followed in four or five hours by the tablets.

He thanked Dr. Brownlee for his able address.

Mr. H. W. Steele-Bodger: He thought they owed a debt of gratitude to Mr. Brownlee for the compliment he had paid to Fellows of the Society, first for asking them if they were well acquainted with his aspect of the subject and, secondly, in doubtless assuming that they now knew all about that of which they might previously have been in ignorance. There was one exception to that in that room. (Laughter.) Messrs. Barrett, Anderson and Pugh also deserved thanks—his in particular—for each of those individuals had jogged his memory and given him fresh ideas for introduction into his own work.

Mr. Barrett and Mr. Anderson both mentioned the use of sulphanilamide in rumenotomy. As the former knew, in the practice he had helped him (the speaker) to maintain, they did quite a lot of that, and he thought they had solved the difficulty to which reference had been made. They relied very much upon sulphanilamide, not only in the abdominal cavity but between the layers of muscle, the edges of which they drew gently together and sutured, placing no strain at all on the muscles. Mr. Rorrison had done several dozen in the last 12 months and nearly all had healed by first intention. They thought it was very important to have a sterile syringe for infiltration of the anaesthetic.

If he might touch on pigs, which had not been mentioned, they did use sulphapyridine to a considerable extent, in their limited pig practice, with great success—but he was sorry Mr. Shanks was not there, because it was he who introduced the use of sulphapyridine in pigs to Northern Ireland. When he (Mr. Steele-Bodger) was over there, he visited a farm with Mr. Shanks and Dr. Lamont upon which at one time 11,000 pigs were kept upon less than five acres of ground. Among them were 1,500 breeding sows, and at one time they had a great number of deaths. Following the use of sulphapyridine in tablet form, it was such a rarity to lose a pig at all that a most careful *post-mortem* examination was carried out in each case. They had on that farm two individuals whose sole job it was to take the sows' temperatures three times a day for two days before farrowing and three times a day for three days afterwards. If the temperature was elevated more than one degree they used 14 tablets M. & B. 693. Since then they had never lost a sow at parturition; moreover, he believed they made a habit of giving every pig after weaning one or two tablets of sulphapyridine weekly, and it was claimed that so long as this practice was maintained trouble was rare, but if the practice was discontinued, epidemics ensued. This did not bear out the concentration theory, but after all that was not an unusual finding! It was only by trial and error that one learned, but he, for his part, was convinced that sulphonamide therapy had come to stay.

Mr. C. Horton-Smith had been much interested to hear Major Kirk refer to coccidiosis in cats and the limited treatment of that animal by sulphapyridine and sulphathiazole. He could tell him that in poultry, too, neither of these drugs was really effective, but he would put in a plea for sulphamezathine. The results of this work, which had been published, were very satisfactory to date. As they probably knew, the drug was fed as a saturated solution in place of drinking water. It was used in epidemics of coccidiosis as soon as blood appeared in the droppings, with the result that there was a considerable reduction in mortality. The interesting thing about that was that the asexual stages developed normally to the second generation, but in the later phases of the cycle one could observe complete and somewhat unique changes. While untreated chicks showed perfectly normal late phases of the cycle, a complete cessation in development was observed in treated chicks. In those birds gamete formation was inhibited if the drug had acted long enough, *i.e.*, for ten days after the death of the last control birds. In other words, oocyst formation was suppressed. The important thing practically, he thought, was that the recovered chicks which had received treatment subsequently were immune to fresh infection, provided that the initial infection obtaining in the epidemic was at least as high as that producing immunity in untreated chicks.

They had recently been making some detailed studies of these drugs, but he would leave that aspect for Dr. Boyland to say a few words about later. At the same time, he would like to make an appeal to those present for specimens of coccidiosis in cats and other animals, as he felt that it would be well worth while to test sulphamezathine against other coccidia: in certain cases of infestation with other species in other animals the results were promising.

Dr. Brownlee had made a cogent remark *re* the identification of the organism. This was one of the great difficulties in diagnosing an outbreak in the field, as so many people assumed coccidiosis on the presence of oocysts alone. That was no criterion, because when one realised that most animals carried a normal burden of coccidia of various species and that a single schizont could give rise to many oocysts after gametogony a very minor infection might produce large numbers. It was also known that several species were not pathogenic to chickens. The only reasonably sure means—and he was afraid that even these were far from satisfactory—were the isolation of the schizonts themselves by deep smear preparations either from the caeca or the intestines and histological examination, and then one had to assume that one's findings in single individuals would probably be similar to those present in the flock. He would like to sound a warning to those

who were contemplating the use of the drug in treatment: one had to be certain that coccidiosis was the primary trouble with which one was dealing.

Dr. BOYLAND: He had very little to add to Mr. Horton-Smith's remarks about sulphamezathine except to say that in order to get the best effect from the drug it was necessary to get blood concentrations of about 10 mg. per 100 c.c. They had been able to show that treatment of coccidiosis was neutralised by oral administration of paraminobenzoic acid; 20 molecules of sulphamezathine were neutralised by one of paraminobenzoic acid.

Mr. D. D. OGILVIE: Dr. Brownlee had said that if one found an organism which did not respond to one of the sulphonamides it would probably not respond to any of them. He believed, however, that the Medical Research Council, in their recent bulletin on the use of the sulphonamides, made the clinical recommendation that if one sulphonamide failed to effect a complete cure it was best to switch to another rather than persist with the first; that seemed rather a contradiction of what Dr. Brownlee had said.

The same speaker had wondered why 4:4¹-diaminodiphenylsulphone had not come into use in the veterinary field. He (Mr. Ogilvie) believed that it was because it was difficult to make and because sufficient investigation had not yet been made of its properties. Undoubtedly it was a drug of great possibilities. It had been shown to be intrinsically more effective than any of the sulphonamides, and early tests had been conducted in bovine mastitis. In that connection, he must emphasise that the urgent necessity was of learning more about mastitis from the causative viewpoint rather than from the therapeutic angle. In his opinion, too much time was being taken up in testing various chemotherapeutic substances and too little in elucidating the fundamental problems involved.

He must disagree with the observations made by Major Hamilton Kirk about promin in relation to its effect on the tubercle bacillus; this drug was simply a solubilised form of 4:4¹-diaminodiphenylsulphone, and he did not think there was any real evidence that it would kill that organism, although it did prolong the life of laboratory animals experimentally infected with tuberculosis.

He thought it curious that Dr. Brownlee had omitted "sulphamezathine" from his table: by and large it was the equal of sulphadiazine.

Mr. Barrett had made a point about sulphanilamide being ineffective in wounds of cattle. Professor Wright, at a recent surgical demonstration near Liverpool did a rumenotomy and also a scrotal hernia in a horse. Observing that Professor Wright dusted the wound in the horse with sulphanilamide but not in the cow, he asked him why, receiving the reply that the normal flora of cattle wounds were not affected by the sulphonamides.

Mr. Anderson had made the points that the sulphonamides should be used specifically and administered only for short periods. He (Mr. Ogilvie) was heartily in agreement, but he thought the medical profession were more guilty than the veterinary profession in prolonging sulphonamide treatment. Mr. Anderson had also stressed the necessity for prohibiting all laymen from using sulphonamide drugs and had laid the onus on commercial firms for preventing them from obtaining them. He (Mr. Ogilvie) wished to point out that although reputable firms would not, of course, direct such drugs towards laymen, they could not prevent farmers, etc., from purchasing them at any retail chemists by certifying that they were for use in their business. This was obviously a matter which should have the attention of the profession in general and the N.V.M.A. in particular.

Dr. J. CARMICHAEL (Uganda): He had used the sulphonamide drugs in a case of open joint with great success. He was interested to hear Mr. Steele-Bodger mention the preventive value of one tablet of M. & B. 693 given to young pigs, because he met an R.A.M.C. officer in charge of a troopship going to the Far East, who told him that it was possible to prevent an epidemic of cerebro-spinal meningitis by giving one tablet of that drug daily to each man.

Major PUGH: He had used sulphamezathine in coccidiosis in cattle with very good results, but it was very difficult to know how far the drug was responsible. He was referring now to three very valuable tubercle-free Guernseys that had persistent diarrhoea. He examined them carefully for parasitic gastro-enteritis, and found that oocysts were passed in the faeces. He therefore dosed them with sulphamezathine and the diarrhoea ceased from the second day; in no case was there a relapse. He started with a 3-oz. dose, followed by 1 oz. three times a day. He stopped at a pound: that seemed to be sufficient to stop the diarrhoea and subsequent examination of the faeces did not show oocysts over a number of weeks: after that time they picked out a few again. He had used a saturated solution of sulphamezathine in an outbreak of diarrhoea amongst chickens. It was administered for coccidiosis, but it was an interesting fact that there were a number of cases of fowl paralysis and there had been none since.

Dr. G. SLAVIN: At Weybridge they had been able to produce experimentally two diseases of sheep, vibrionic abortion and staphylococcal mastitis. Sulphapyridine was tried against vibrionic abortion without success, but as they waited until the sheep started to abort before starting treatment the test was severe and might have been asking too much of the drug. Staphylococcal mastitis was treated with sulphapyridine, sulphathiazole and toxoid, using a separate group of sheep for each treatment, but the results were entirely negative. In fact the results were rather in favour of the control untreated group.

One gramme per kg. of sulphaguanidine entirely prevented the development of experimental paratyphoid infection in pigs. In another experiment 0·2 grammes per kg. of sulphaguanidine prevented the development of the infection during the course of treatment. During the four days the pigs were treated, the faeces were free from *S. suipestifer*, but three days after the drug was stopped the pigs went through a mild infection and *S. suipestifer* was recovered from the faeces.

Major R. F. WALL: In shipping fever in mules and horses sulphanilamide had been extremely useful. He had used the sulpha drugs with varying results in operation wounds. They often met with haemorrhagic gastro-enteritis in greyhounds; sulphaguanidine was recommended to him very highly for that condition, but he regretted to say that in his hands the results had been most disappointing. In many cases of distemper with lung complications sulphapyridine had proved highly beneficial. In distemper, and the sequelae of distemper, he had never yet found any improvement to follow the administration of the sulphonamides.

Mr. J. C. BUXTON: Two of the most important factors governing sulphonamide therapy were firstly that the drug, or its active principle, should be able readily to find its way out of the base in which it was administered and secondly that it should make itself available at the site of infection in therapeutic concentration. Thus, the fate of a particular preparation after it had entered the body of an animal by a specified route was a matter of some importance and, although this had been studied in the human subject, there was no very exact knowledge from a veterinary standpoint.

They knew that sulphonamide drugs were rapidly absorbed into the bloodstream and that during passage through the liver a proportion of the circulating drug became acetylated, being thus rendered inactive and even toxic; but they had no proper knowledge of the sulphonamide absorption picture as a whole in animals and this merited investigation.

From work which they had carried out at Weybridge on the absorption of sulphonamides from the bovine udder, the factors of chief importance seemed to be the form of the drug and the base in which it was administered. Aqueous solutions reached a high peak blood concentration very rapidly which tended to fall equally fast, whereas insoluble suspensions were much more slowly absorbed, the base in which they were given being the guiding factor in speed of absorption.

Dr. J. T. EDWARDS congratulated Dr. Brownlee on his remarkably able address given as it was to them by one who was himself an experimental pharmacologist. After a period when there had been great promise of a stream of discoveries that would revolutionise the working life of the ordinary practitioner, following upon Ehrlich's brilliant conception before the end of the last century of "chemotherapy"—the search for chemical agents that were maximally "parasitotropic" and minimally "organotropic"—things had for long come almost to a standstill. It had seemed indeed that the conception was only likely to be fruitful as applied to the diseases caused by protozoan parasites, and in spite of the close attention that had been paid to the possibility in the early days one had almost abandoned all hope that the bacterial and other diseases would prove amenable to treatment on similar lines. From the story unfolded to them that afternoon by Dr. Brownlee, all that they really needed to retain in their minds from it as veterinarians was that the field of the bacterial diseases had now been breached by the expert engaged in that particular field of work at several points. Furthermore, in this process of breaching this field, with the knowledge now at their disposal from advances in other fields, the scientific means were now rendered available to the pharmacologist to devise, test, and eventually recommend to the practitioner an unending variety of new drugs. It was the duty, it need hardly be said, of the pharmacologist himself, using the disciplines of his own craft and after submitting his findings to colleagues of his own who were also versed in that craft, and spoke, as it were, his language, to recommend to the practitioner, whose ordinary interests debarred him from familiarity with that language, only such products of his skill as could be confidently recommended. On the practitioner's part it was his duty to himself, the speaker submitted, as well as to his patient and the owner, to employ only such products in the course of practice as had the commendation of the pharmacologist, and not to be beguiled by the specious claims of commercial interests. He (the speaker) ventured on these remarks for the benefit of his veterinary colleagues in practice, because after some preliminary training in the subject he had had some years ago a fairly intense experience abroad testing chemotherapeutic products evolved. It was indeed in the veterinary field, and particularly in the tropics, that "chemotherapy" had had, until very recently, some of the most spectacular successes to its credit—successes that were hardly known in the medical field. These related particularly to some of the well-known trypanosomiases and piroplasmoses. He (the speaker) recalled being present, with their Hon. Secretary, Mr. Pool, at a meeting held at the Royal Society of Medicine, on October 3rd, 1935, when a senior member, Professor Hörlein, of the distinguished team of workers at Elberfeld who had since put the world on the scent, as it were, of the sulphonamide drugs, was invited across to address them on "The Chemotherapy of Infectious Diseases caused by Protozoa and Bacteria" (*Proc. Roy. Soc. Med.*, 1955-36, **29** (i), 313.). At that meeting, what Hörlein communicated with enthusiasm, and what he (the speaker) listened to with deep interest, was the announcement of the discovery, following upon the researches continued by the Elberfeld team, of a chemical substance that would be even better than trypanblue for use in veterinary practice. As they already knew, trypanblue cured infections caused by *Babesia canis*, "malignant jaundice," or "tick fever," in dogs, and *Babesia bigemina*, tropical bovine redwater, or Texas fever, as if by magic, but until then nothing had been found which had a genuinely specific effect on British redwater, caused by *Babesia bovis* ("*divergens*"). At the meeting Hörlein unfolded to them the story of how that goal, as was then becoming clear from the results reported in practice, had been achieved with the discovery of Acaprin. It was almost laconically that he continued the story further, describing how, with his colleagues, about 25 years previously, he had prepared certain dyes ("azodyes with sulphonamide and substituted sulphonamide groupings") for use in wool dyeing, and how one of his colleagues, Domagk, had just then, with Ehrlich's outlook upon possibilities still in mind, tested one of these compounds, *prontosil*, upon experimental streptococcal infections in mice. The medical men present paid little heed to acaprin, which to the veterinarian was a sound discovery, but had their attention aroused by prontosil. The story since then had now become familiar—how the material was tested cautiously on puerperal sepsis by Colebrook, and so on, as had been well described by Dr. Brownlee. In its origin the discovery was one of luck though the opportunity might well not have been seized had it not been that Ehrlich's conception of "chemotherapy" provided the inspiration which led the first workers to probe into the possibilities which, as it just happened, had in the hands of specially trained workers, the pharmacologists, since yielded the far-reaching and highly practical results with which they had now been made familiar.

A point which had been omitted by Dr. Brownlee from his address, bearing as it also did on the paramount part played by the "accidental" in the beginning of discovery, was the antagonism displayed between sulphur and iodine in the body, and how the accidental finding that small laboratory animals subjected to prolonged sulphonamide therapy developed goitre, namely of the hypertrophic variety, in which the hypertrophy was an attempt on the part of the thyroid gland to compensate for the diminished secretion of the iodine-containing hormone, thyroxine. Concurrently, it was found that in people and laboratory animals prolonged feeding upon the *Brassicae* produced similar changes in the thyroid, and it had since been found that the effects were caused by certain relatively simple sulphur-containing organic compounds—thiouracil and thiourea—present on these plants. The Brassica goitre and the sulphonamide goitre could therefore be related to each other, and interpreted as the effect of the sulphur in each case antagonising the essential and characteristic element of the thyroid secretion, namely, the iodine, the gland therefore resorting to overgrowth in an attempt to compensate. Remarkable use had been made, as was now well known, of this phenomenon recently in the treatment of toxic goitre (Graves's disease) in the human subject, in which the increased circulatory and metabolic activity was caused by a pathological increase in the secretory action of the thyroid. Parenthetically, the findings also implied a warning against excessively prolonged administration of the sulphonamide drugs.

Two of the disturbing things that had long been familiar to the workers who were engaged in the practical treatment of human beings and animals with chemotherapeutic substances were, first, the occurrence of resistant "strains" within a species of pathogenic micro-organisms that was, on the whole, sensitive to a particular substance, and secondly, the development of "drug-resistance" by a strain that had previously been "drug-sensitive." Clinicians needed to be on their guard against these possibilities, and especially so, so that they would not be put off a good and sound line of treatment because they had unfortunately encountered circumstances in which, unbeknown otherwise to them, the treatment had displayed its limitations. A striking example of such occurrence having a profound effect on affairs had been recorded recently. While the British Army was in Tunisia and Algeria the cases of *Neisseria gonorrhoeae* infection were successfully treated parenterally with sulphonamides, with experiences similar to those usually obtained now in the United Kingdom, namely, without the need for hospitalisation. After the landing of the troops in Sicily, however, a sulphonamide-resistant strain of the gonococcus was encountered, and much dislocation was caused owing to the need for prolonged treatment by the older methods (Campbell, W. J., 1944, *Brit. med. J.*, ii, 44). Having that example in mind, veterinary clinicians need not be unduly dismayed by the occasional unfulfilment of expectations in their particular patients. Perhaps, as had been stated recently by certain eminent dermatologists, the sulphonamides had already reached the high peak of their popularity, and in their particular field as much space had now to be given to the description of skin rashes and other troubles caused by them as to skin troubles cured by them. On the whole, however, such rashes were trivial and soon vanished,

and the inconvenience caused by them was negligible in comparison with the dramatic successes that were to be recorded, especially in the domain of respiratory infections. Now, it seemed, that pride of place would be yielded by the sulphonamides to the newer, penicillin therapy, and it was only lack of available supplies that prevented more widespread use of the latter. This in the end would probably prove an advantage because it might be found that in the meantime a thorough knowledge had been obtained of both the real uses and of the limitations of that form of therapy.

The dangers caused by exploitation through commercial interests ought, therefore, to be avoided. In any case, the use of the sulphonamides rested, as was competently outlined to them by Dr. Brownlee, on secure scientific foundations, and was not a passing fancy or fashion.

Mr. D. N. SPRIGGS: There was one aspect that he was rather surprised that the clinicians had not mentioned that afternoon, and that was the uterine conditions in cattle. One, in particular, was the persistent discharge in cattle after apparently calving quite normally. He would like to ask Mr. Barrett for his advice as to whether any of the sulphonamide drugs, given at the time of calving, *per os*, would be likely to be of value and, if so, which. In his experience one obtained rather a mixed flora from these discharges.

The PRESIDENT (Dr. W. R. Wooldridge): Before calling upon, first, Mr. Barrett and then Dr. Brownlee to reply, he would like to enlarge on the most important point put before them by Dr. Brownlee. He had indicated clearly that there had been tremendous advances made in our knowledge of what happens in the living cell, whether the cell be part of a multicellular or a unicellular organism, and that a chemical or drug might influence the functioning of either of these cells through disturbing its enzymic mechanism. The same drug might, however, disturb the metabolism of one cell much less than that of another, and so differential cellular effects could be obtained.

It had also been shown that even when two cells had similar metabolic mechanisms the concentration of a particular metabolite necessary for one cell might differ from that required by another. These differences enabled us to use these special antibiotics to inhibit differentially the life processes of a parasitic cell even when parasites were distributed within the cellular tissues of the host animal.

Other recent researches had shown that the enzymic character of an organism could be altered by changes in its environment. These adaptations in the biochemical sense served to warn us that the use of an antibiotic might produce a type of organism which would not be affected by that particular agent. This emphasised the necessity to maintain an adequate dosage during treatment to inhibit the parasitic organism swiftly and completely and so reduced the possibility of producing resistant variants.

Finally, on behalf of himself and the meeting, he thanked both the opening speakers and those who had sustained the discussion. Their contributions should help to clear the way for the most effective use of not only the sulphonamides but penicillin and such other new drugs as the future might disclose.

THE REPLIES

Mr. BARRETT: He had learned a great deal, for which he was very grateful. Only one question had been directed to him, and that was by Mr. Spriggs: the point was whether in those cases of post-parturient infection that were difficult to clear up it would be useful to adopt sulpha therapy at the time of parturition. The difficulty was that you would not know which cow was going to be affected in that way.

With reference to treatment, he had found that there were quite a few cases that would not respond to Lugol's treatment, frequently repeated, and he had used 1–1,000 aqueous solution of acriflavine, with a suspension of the sulphanilamide in it, without any good results; he had had better results, in fact, with saturated magnesium sulphate solution.

Dr. BROWNLEE: He thought that many of the small difficulties which had arisen were the product of his mode of treatment of the subject in his paper; he would now come squarely down to earth. (Laughter.)

Dealing first with a point raised by Major Pugh, in putting forward the thesis that it was desirable to classify the organisms for resistance to sulphonamides, he was, of course, thinking particularly of clinical research workers engaged in clinical trials involving the treatment of a pathology of parasitic origin with chemotherapy. In a well recognised infection in the field it was neither necessary nor desirable to delay treatment to the extent of awaiting laboratory evidence of resistance or susceptibility; at the same time it was quite usual for original observations to arise in this sort of way and it would be valuable for practitioners to have before their minds the possibility of resistant strains when apparently intractable infection was met. At that stage the simple tests suggested might prove helpful. Major Kirk raised a point on similar lines. The dosage question had been adequately covered by the speakers subsequent to himself, and he would restrict himself to the observation that the dose administered was not the ultimate goal; that was the concentration of drug in the body-fluid from which the pathogen in question drew its nourishment.

This linked on to the point raised about ringing the changes on sulphonamides. What had been said about the quantitative nature of sulphanilyl drugs did not negative this idea, on the contrary, it reinforced it. The principle was backed by practical trial and received favourable comment in the leaflet referred to by the questioner, *e.g.*, with respect to the treatment of meningitis and gonorrhoea.

A misconception, he thought, arose out of an observation of his (the speaker's) about sulphanilyl drugs not being therapeutic agents and a reference he made to toxicity. By this was meant that the antibiotic used was indiscriminate in attacking the enzyme systems of host and parasite. The toxicity was frequently masked by the event of recovery, but its effect could be frequently observed in the very rapid decline in unsuccessful therapy. This was well illustrated in the case of chemotherapy of small laboratory animals where a proportion of infected but untreated animals always lived some days; treated by unsuccessful chemotherapy, they died promptly. An interesting and different source of toxicity arose out of the ability of sulphanilyl drugs, and particularly intestinal types, *e.g.*, sulphaguanidine, to modify the intestinal flora. When it was remembered that many animals utilised the metabolic products of bacterial nutrition as essential growth substances this aspect was of special importance. It was one reason for frowning on the small continuous prophylactic dose mentioned by one questioner.

A point was raised with respect to the use of sulphapyridine which was largely a misunderstanding. It had been quoted as an expensive drug to use; the point was to avoid waste by ensuring that the prospective pathogen was indeed susceptible.

Reference was made to the fact that he had not included sulphamezathine—this was no intentional slight on a member which was proving so valuable in fowl coccidiosis, but merely that he had restricted himself to examples, and of necessity the lesser known members had been left out. At the same time sulphamethazine had been not altogether so active as its structure promised; it was curious that it seemed to be ineffective in gonorrhoea.

There was a complaint that the sulphanilyl drugs did not attack the acid-fast organisms. This was not so; certain acid-fast organisms were susceptible to sulphanilyl drugs, and in particular to derivatives of sulphones. The evidence that these sulphones were chemotherapeutic was not altogether satisfactory, and it was premature to speak of their employment in intramammary tuberculosis. Research work in this field was, however, receiving very active support in this country at the present time.

CLINICAL COMMUNICATION

Three Cases of Ovarian Abnormality in the Bitch

HARRY HOLROYD, M.R.C.V.S.
and
ALEX. H. HOGG, M.R.C.V.S.

INTRODUCTION

Of the various diseased conditions and abnormalities which affect the genital system in the bitch, by far the greatest preponderance occur in the uterus, at least as far as clinical cases are concerned. The ovaries may suffer to a greater degree, than is realised, but the abnormalities here are probably more concerned with dysfunction or malfunction from the point of view of the organ as an endocrine gland and the grosser lesions of a disease process such as is commonly met with in the uterus are relatively rare. The following three cases have been seen in as many months after a long period where not a single case which could be classed in this category has been encountered.

CASE I

The first case is that of a wire-haired fox terrier bitch, four years old, which was first seen by one of us (A. H. H.) on November 22nd, 1944. The bitch was presented with a history of inability to retain urine and a gradual loss of weight although eating well. The temperature was 103·5. In appearance the bitch resembled a pregnancy of about six weeks' duration. Abdominal and rectal palpation seemed in no way to contradict this. The owner, although of little help in confirming or excluding the possibility of coitus, gave the approximate date for termination of oestrus, which coincided with our view of a six weeks' pregnancy. The owner herself believed the bitch to be pregnant, but came to us for confirmation or otherwise. Unfortunately, as it later turned out, we gave a guarded opinion of pregnancy. Very little was therefore attempted by way of treatment with a view to lowering the temperature or controlling the urinary incontinence. There was, however, some doubt regarding the diagnosis and the bitch was seen several times within the next few weeks. Nothing further was elicited, the abdomen increased in size, urinary retention became nearer normal and the temperature dropped. Several times what were believed to be the bodies of the pups were palpated per abdomen during this period. On December 16th, 1944, the case was seen for the last time until its termination, and the diagnosis of abdominal tumour probably of hepatic or gastric origin (the main body seeming to lie in the left hypogastrium) was substituted for one of pregnancy. The bitch was then becoming emaciated, drinking a lot of water, temperature normal. General appearance was that of a full term pregnancy. What had been previously palpated as foetal bodies were now taken to be the various nodules of the main tumour mass. On this basis destruction was advised; the size of the mass and its almost certain malignancy made operation out of the question. The owner, no doubt somewhat dubious at our rather ill-timed withdrawal of the diagnosis of pregnancy (full term if pregnant) and our inability to do anything tangible other than destruction, refused to allow the bitch to be destroyed. No more treatment was attempted, the case being merely kept under observation until it became obvious even to the owner that the animal was suffering from "cancer," and it was destroyed on April 12th, 1945. The dog suffered no discernible pain throughout and ate well until the last few days, which may have precipitated the final consent to have it destroyed.

Post-mortem Examination.—On opening the abdomen, about half a pint of a foul-smelling, greenish-yellow, milky fluid escaped. A large tumour mass the size and shape of a small football occupied the greater part of the abdominal cavity. This tumour originated from the left ovary. The right ovary and womb were normal. The tumour, which unfortunately was not submitted for histological examination, was composed of a main mass with numerous, irregular nodules, of varying size, projecting from it. The mass itself was hollow with walls an inch thick, containing a foul-smelling reddish-brown fluid. Scattered over its surface and on the surface of the nodules were numerous thin-walled cysts, some single, some multiple. There was also present on the most ventral aspect of the main body of the tumour a corpus luteum lying approximately nine or more inches from the termination of the left uterine horn.

CASE II

The second case is also that of a wire-haired fox terrier bitch, aged seven years. It was seen first (A. H. H.) on February 22nd, 1945, and a history was given of the dog having been continually in season for weeks. As far as was known the bitch came in season before Xmas and had never gone off. The animal was

of nervous temperament, and in fairish condition, eating well. It was being kept indoors all the time since it was impossible to take it out on a leash when all the dogs of the neighbourhood tailed its heels. The vulval lips were swollen as in normal oestrus but the discharge was gleety and colourless. An endometritis was suspected and treatment with a sulphonamide and stilboestrol dipropionate per os was commenced. As in the previous case, the diagnosis was suspect and the treatment was prescribed in the belief that if the condition actually was endometritis it would improve, whereas if it turned out not to be an endometritis but an ovarian disorder it would probably worsen. The dog was seen again on March 1st with no change either way in the main symptoms, although the general condition was deteriorating. Cystic ovaries were diagnosed, although there had never been anything palpable per abdomen. An operation for their removal was advised and agreed to. A warning was given as to the risk involved since the dog's general condition and its nervous temperament combined to make the anaesthetic risk only fair. Operation under nembutal anaesthesia (performed by H. H. on March 2nd) was uneventful, a cystic ovary being removed on the right side and a normal ovary on the left. The uterus was normal and was therefore left *in situ*. In spite of normal precautions against shock and sulphathiazole per os to counteract risk of infection, the bitch died on the night of March 4th, from the shock of the operation. The affected ovary presented on its surface a solitary cyst an inch in width, the gland itself being normal.

Case III

The third case (H. H.) is that of a Scottie bitch aged twelve years, presented on March 17th, with a history of slight vomiting and loss of weight. The breath had a foul smell and the bitch was in fairish condition only. There had been diarrhoea for two to three weeks. Palpation per abdomen revealed the presence of a large object the size of a tangerine orange. Further exact diagnosis was impossible by palpation and the only course open was that of an exploratory laparotomy. Considering the age of the dog, and in all probability the hopelessness of the prognosis even after laparotomy, the owner decided on advice to have the dog destroyed.

Post-mortem Examination.—This revealed the presence of two large cystic ovaries. The right ovary measured 4 × 2 inches and the left 2·5 × 2 inches. The ovaries resembled those which are met with in the larger animals, *i.e.*, composed of multiple cysts. Their size was out of all proportion to the size of the animal. There was no history of any abnormal oestral behaviour in this case. In the three cases above described none of the bitches have ever been mated. In their main points each of them is exceptional and uncommon in our experience.

Discussion

Case I.—The main point of this case was that of differential diagnosis between pregnancy and an increasing abdominal tension of unknown cause. Pyrexia during pregnancy is not unknown, frequent micturition is sometimes seen in the later stages and alteration in appearance through increased weight and tension in the abdomen with the throwing into relief of the vertebral column and its spines may easily be mistaken for pregnancy. The tumour mass was not submitted for histological examination and we are therefore unable to say within which category of neoplasm it must be classed. It did not resemble cystic ovary as is generally recognised (see Case III), although typical ovarian cysts appeared on its surface and the main mass itself was hollow. Ovarian tumours are described in the human which sometimes attain enormous size simulating pregnancy. The entity is seemingly well recognised and operations for their removal have been described at various times in the medical literature. This is the first case of its kind we have encountered in the bitch.

Case II.—The main point in this case also lies in differential diagnosis between cystic ovary with hypererotic symptoms (nymphomania) and an endometritis. By endometritis here we mean a functional or glandular disorder commonly met with shortly after an oestral period and which, if allowed to go unchecked, will eventually progress to sterile pyometra. The discharge of endometritis following close on an oestral period (a long heat ?) is attractive in many cases to male dogs. The vulval lips are normal in size in endometritis, the discharge more copious and coloured, etc.

Case III.—Cystic ovaries (single and multiple cysts), either with or without hypererotic symptoms, are not uncommon in the cow and mare, but a similar condition in the bitch is evidently much rarer judging by the literature. The abnormality is often operable in the large animals and, in the case described above, might possibly have been surgically removed. The size of the ovaries in our case was perhaps exceptional but the case serves as a reminder that exploratory laparotomy is always justifiable if the animal warrants it.

ABSTRACTS

[A Twenty-four Hour Pregnancy Test for Equines. Zondek, B., and Sulman, F. (1945.) *Nature*, Lond. **155**. 302-3.]

The hyperaemic reaction of the infantile rat ovary following the injection of human pregnancy urine was first used as a basis of a rapid pregnancy test by Reiprich in 1933 (*Klin. Wschr.* **12**. 1441.) This method has recently been "rediscovered" in America and has aroused considerable interest [Editorial, *J. clin. Endocrinol.* **4**. 410. (1944.)]

Zondek and Sulman have now shown that the gonadotrophin present in pregnant mares' blood also evokes the hyperaemic reaction and have utilised it as a rapid (24-hour) test for equine pregnancy. The reaction time required for the biological test is thus considerably reduced as the original rat test of Cole and Hart required five days and their recent modification two days.

Three infantile rats are given two injections of 1 to 2 ml. of the mare's serum; one rat is autopsied at six hours, the others at 24 hours after the first injection. The test is considered positive when both ovaries of one of the rats show a distinct red colour resembling that of spleen. The authors claim 99 per cent. reliability for the test. In 30 to 50 per cent. of the positive tests the result is obtained at the sixth hour. This 24-hour test is said to be slightly less sensitive than the five-day test and it is advisable to include for control purposes a fourth rat, which is examined on the fifth day, as in the original test.

A. T. C.

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[A Study of the Gestation Periods of Five Breeds of Cattle. Livesay, E. A., and Bee, U. G. (1945.) *J. anim. Sci.* **4**. 13-14.]

The authors have carefully analysed the breeding records of the college herds at West Virginia University. The records extended over a period of 15 years. The average gestation period for the Aberdeen-Angus was 282·5 days and for the Hereford 285·2 days; this difference of 2·7 days was statistically significant. The average length of the gestation periods of three dairy breeds—Jersey, Ayrshire and Holstein Friesian—were respectively 277·9, 277·8 and 278·3 days. The variations between these three dairy breeds were not significant, thus disproving the assumption that early maturing breeds such as the Jersey have a shorter gestation period. An analysis of variance showed a significantly shorter gestation period for the three dairy breeds as compared with the two beef breeds, this difference being 5·8 days.

A. T. C.

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[Zoologic and Histologic Modification of the Distemper Virus by Ferret Passage. Green, R. G. (1944.) *Amer. J. Hyg.* **41**. 7-24.]

Investigations of epizootic outbreaks of distemper on fur-animal ranches showed that a virus strain highly virulent for dogs and foxes might be less pathogenic for mink and that a virulent mink strain might be of low virulence for dogs and foxes. A virulent canine strain was serially passaged in ferrets in the hope that the virulence would become sufficiently diminished to permit the modified strain to be used in efforts to control the naturally occurring disease on the ranches, previous efforts to control the disease with serum and commercial vaccines having failed. After 54 ferret passages the virus, on subcutaneous injection, produced only a mild immunising infection in foxes which arrested the progress of an epizootic. Virulence for the dog was also diminished but not to the same extent.

When the virus was passaged in ferrets by skin transfer instead of by the routine subcutaneous inoculation of spleen tissue, certain pathogenic modifications were noted.

W. M. H.

DISTILLERS' BY-PRODUCTS FOR SWINE

Swine rations commonly made up from feeds containing adequate proteins and minerals are frequently deficient in vitamin B_2 and the known and unknown factors lacking are supplied in dried corn distillers' solubles, especially during lactation. However, while fortifying such a ration with B_2 soluble removes the deficiency of rations fed after weaning, the study does not determine the factor or factors of the B complex responsible for the improvement. Riboflavin, niacin and pantothenic acid were adequate as shown by assays for these ingredients. It was therefore concluded that pigs up to 100 lb. (45 kg.), that are growing and fattening, require more vitamins than was previously believed, that assays for riboflavin, niacin and pantothenic acid require refinement, and that the limited amount of vitamin or vitamins contained in the basal ration is not nutritionally equivalent to synthetic vitamins used to supplement an experimental, purified diet.—*J. Anim. Sci.*, May, 1944.

REVIEW

[Etiology, Diagnosis and Control of Infectious Bovine Mastitis. I. A. Merchant and R. A. Packer. (1944.) Burgess Publishing Co., Minneapolis. pp. 65.]

This booklet was prepared mainly for the student, but it is claimed that it will also be useful to the practising veterinarian. This claim appears to be justified as it presents, fairly adequately, most of the accepted facts and theories about all aspects of mastitis. There are also quite detailed descriptions of the various techniques used for the diagnosis and treatment of mastitis and about 50 references to the literature.

The section dealing with "the source and transmission of infective agents" is the only one requiring detailed criticism. It is stated that: *Str. agalactiae, Str. dysgalactiae* and *Str. uberis* can only be isolated from the bovine udder, and it is not known whether *C. pyogenes* is a natural inhabitant of the upper respiratory tract of the bovine; in discussing the origin of mastitis due to *Staph. aureus* the possibility of infection from human but not bovine sources is mentioned.

It has been shown (*Vet. J.* (1941.) **97.** 243) that *Str. dysgalactiae, Str. uberis, C. pyogenes,* and haemolytic staphylococci, but not *Str. agalactiae,* can readily be isolated from the bovine tonsil and vagina. Sporadic infection due to any of the bacteria commonly associated with mastitis except *Str. agalactiae* may therefore arise due to infection from these sites.

REPORT

[New South Wales: Livestock Disease Report, 1943-44. (Reference A.I. 40/2808.)]

This report by Mr. Max Henry, Chief of the Division of Animal Industry, records continued and effective endeavour in disease control, by both field and laboratory staffs, maintaining a high standard of animal health.

Much anxiety was felt regarding the possible introduction of rabies owing to attempts to introduce illegally pet dogs acquired by members of Australian and Allied Forces campaigning in infected countries; this, however, is an unfortunate situation shared by all "clean" countries at present, being a natural concomitant of war. Within the continent of Australia the serious spread of two parasites—the Buffalo fly (*Lyperosia exigua*) and the Stickfast flea (*Echidnophaga gallinacea*)—into N.S.W. appeared inevitable, control constituting a difficult problem indeed. Swine fever was once more eradicated but there will always be danger of reintroduction unless the strictest quarantine measures can be maintained. Other diseases of pigs, notably erysipelas, pox, brucellosis and tuberculosis were receiving due attention.

Amongst Research Notes, "Mastitis in cows" is perhaps of most general interest, *viz.*: "Trials of various drugs as udder infusions have continued. The difficulty is to obtain a drug which will eradicate the streptococci from the udder without causing severe local reactions. The use of acriflavine in the field trials was not encouraging. Sulphanilamide in watery suspension was not satisfactory, although it did have good results in 25 per cent. of cases treated. Monacrin, a proprietary flavine preparation, has given complete eradication of the streptococci in a few cases treated, but its cost will probably prevent its widespread use. Phemerol, another proprietary preparation, has good germicidal powers but was highly irritant on test. One cow treated with this near the end of a lactation period has calved again. No streptococci could be recovered from the treated quarters. Iodised mineral oil recommended by some U.S.A. workers has proved too irritant in the few tests made by us. So far the most promising treatment which could be adopted by the dairy farmer appears to be a suspension of sulphanilamide in maize oil. This is at present under test on a field scale."

Observations continued on the longevity of swine fever virus in meat and bacon and the following are positive records: Frozen pork, virus viable 366 days, longest period tested; bacon, virus still alive 27 days after slaughter and immediately after smoking; virus not detected 57 days after slaughter. In houses free of sunlight, infection was contracted 24 hours after removal of sick animals, but not after 48 hours. Virus persisted in a portion of liver dried in vacuo over phosphorus pentoxide and held in refrigerator for 62 days.

A suitable technique for artificial insemination of cattle had passed local preliminary trials and arrangements were being made for practical field extension.

Disease control measures, specifically mentioned, included pleuropneumonia contagiosa, anthrax, tuberculosis, tick eradication and sheep lice and ked infestations, and in all cases, excepting inevitable minor hold-ups and setbacks, progress appeared to be maintained.

The Glenfield Veterinary Research Station handled some 23,546 routine specimens submitted for examination—a substantial increase on the previous year—in addition to specific and adventitious research and practice.

Marked increase in the numbers of poultry submitted was mainly attributed to the effects of war on the supply of suitable food supplements and drugs as indicated by the increase of avitaminosis and navel-ill in chicks. There was, in addition, a greater incidence of coccidiosis. S. A. E.

MEMOIR

Professor George W. Clough, D.Sc.

An Appreciation

As noted in our issue of March 4th, 1944 (*Vet. Rec.* **56.** 81.), Dr. G. W. Clough died on February 20th of that year. A further tribute to him was promised at the time, but details of his life and work were difficult to obtain. Now, as the result of patient research on the part of certain of his colleagues, the *Veterinary Journal* has been able to publish an extended appreciation upon which we have drawn freely in compiling the following.

Clough was born at Barlaston in Staffordshire on December 1st, 1881, being the eldest son of the late J. W. Clough. He was educated at Alleyne's School, Stone, of which he was head boy in 1896-98, and at Birmingham University, where he graduated in 1902 with First Class Honours, having studied chemistry under Professor G. Frankland.

In these younger days he was a hockey player of county class. After a brief period on the staff of a school at Saffron Walden he joined the staff of the Chemistry Dept. at Birkbeck College, London, where he remained for eleven years and established a reputation as a brilliant teacher and investigator. "In his Birkbeck days," states the account in the *Veterinary Journal*, "records of his first researches were published in the *Journal of the Chemical Society* for the year 1906. In this paper he identified, with great neatness and skill, the different products of reaction of benzophenone chloride with α and β naphthols. This was an original and isolated piece of work, but thereafter he directed his researches mainly towards the solution of one fundamental and exceedingly difficult stereochemical problem. This work was commenced by a very active collaboration with Professor Alexander McKenzie, F.R.S., who went to Birkbeck College from Birmingham in 1906. Between 1908 and 1913 they were the joint authors of six of the first papers, in which Professor McKenzie and his colleagues reported important studies on the chemistry of the Walden Inversion.

"In 1892, P. Walden had found that an optically active compound could sometimes be converted into its antipode by means of substitution reactions and not by way of the racemate. This was a most unexpected and surprising observation in the light of the stereochemical ideas of that time, and it stimulated a vast amount of research, which still continues, for it cannot be said that the precise nature of this phenomenon has been solved. Walden's observation raised two important questions in the minds of research chemists. Since two different substitutions are always required for proof of a Walden Inversion, at which substitution does the change of configuration take place? And what conditions determine whether or not inversion shall take place? Many workers, including McKenzie, G. Senter and their colleagues at Birkbeck, were able to show that the structures of the groups attached to the asymmetric carbon atom, the nature of the substitution reagent, the solvent and the temperature were among the internal and external factors which promoted or inhibited the Walden Inversion. Now Clough realised that in order to obtain an indisputable answer to the first question it was essential to know with certainty the relative molecular configurations of at least all the optically active compounds likely to be employed in studies of the Walden Inversion.

"He set himself the task of determining the relative configurations of a series of optically active *a*-hydroxy, *a*-amino and *a*-halogen substituted organic acids. This was an intrinsically fundamental stereochemical problem quite apart from its importance for the elucidation of the Walden Inversion, and it was already being attacked by purely chemical methods. Such methods gave unequivocable results where changes in the links to the asymmetric carbon atom were not involved, but Clough was able to show that optical methods also gave reasonably reliable results and moreover could indicate the probable molecular configuration of an optically active compound where chemical methods were not applicable or gave doubtful results.

"Clough measured the rotatory powers of many optically active hydroxy, amino and chloro acids and their esters under varying conditions of solvent, concentration and temperature, and for polarised light of different wavelengths. In particular, he made an ex-

[*Courtesy of "The Veterinary Journal."*

tensive study of the effects of strong electrolytes on the rotary powers of these compounds, and his work still ranks pre-eminent in this special field.

"From his observations on a series of acids of known relative configurations, Clough was able to show that the optical rotatory powers of similarly constituted compounds possessing the same relative configuration are in general influenced similarly by changes in the external conditions and also by the introduction of the same substituent into a given radicle attached to the asymmetric carbon atom. Then, by application of this rule to his own optical measurements and to those of others, he was able to indicate the probable relative configurations of many optically active organic acids of the types mentioned above. One noteworthy conclusion, which has since been amply confirmed, was that all naturally occurring *a*-amino acids are configuratively similar to one another and to such hydroxy acids as *d*-lactic acid and *e*-tartaric acid. There are therefore stereochemical descendants of *e*-glucose. The fact that all naturally occurring *a*-amino acids have the same spatial configuration with regard to the asymmetric carbon atom is of special interest to biologists, for it strongly suggests that a single primary mechanism is concerned in the natural synthesis of *a*-amino acids.

"From 1913 onwards, Clough reported his researches independently in a series of papers communicated to the Chemical Society. His work at Birkbeck culminated in his magnum opus, published in 1918. In this paper, he summarised his work on *a*-hydroxy acids, *a*-amino acids and their derivatives. Drawing widely upon the work of others also, he presented consecutive and closely reasoned arguments in support of his conclusions as to the relative molecular configuration of these compounds. Later he effectively answered attempted criticisms of his work. The degree of D.Sc. had already been conferred on Clough by his Alma Mater, and the publication of 1918 set the seal on an international reputation as an outstanding worker in his chosen field of research.

"Dr. Clough left Birkbeck College at the end of 1916, and thereafter, although his work lay in a different field, he never lost interest in his original line of research. Soon after he came to the Veterinary College he found an opportunity to return to the subject and, with the aid of research grants from the Government Grant Committee of the Royal Society, he published two more papers, in 1925 and 1926, in which he reported new observations and confirmed earlier conclusions."

After a short period as head of the Chemistry Department at Blackburn Municipal Technical School and another working mainly on dyestuffs in the Wilton Research Laboratories, Clough was in 1920 elected Professor of Chemistry and Toxicology at the Royal Veterinary College, in succession to Dr. G. D. Lander, and became the occupant of a post which, ever since its foundation in 1839 as the second professorship in the history of the College, had been held by eminent chemists. It is perhaps worthy of remark that the great Van't Hoff was also on the staff of a veterinary school—that at the University of Utrecht. Clough tackled what was to him the new field of toxicology with remarkable success and in a few years was indisputably the leading authority in the veterinary branch of this subject. His publications on the subject were relatively few and most of them brief, while it seems regrettable that he was not asked to revise the well-known text-book of his predecessor or to write his own manual of veterinary toxicology. Some of his specialised knowledge was recorded as legal evidence, much more was passed on to practitioners and others in the form of reports, but except in the form of a few addresses to Divisions, N.V.M.A., syntheses were never published. It must therefore be concluded with sorrow that the greater part of Clough's toxicological knowledge died with him.

As a teacher at the R.V.C. Clough more than maintained his great reputation, and it is gratifying to learn of the memorable ovation given him by his students on the occasion of his last lecture. He felt keenly, however, that despite his popularity with many colleagues and practitioners there was some bar in veterinary circles to his full recognition. His difficulties were not lessened when the reorganisation of the R.V.C. took place and the Department of Chemistry and Toxicology was merged with that of Physiology and Biochemistry and its chair withdrawn. There was, of course, considerable justification in theory for this merger, but in practice it led to the assumption by Clough of a relatively junior position. It is no reflection on his contemporaries, with whom he remained on excellent terms, to say that Clough stood head and shoulders above them both as a teacher and as a scientist. More disappointments were to follow, for the enforced evacuation of the College at the outbreak of hostilities placed him in circumstances in which he was certainly not happy, while he must have been suffering from the early effects of the illness which was to prove fatal. Ultimately he felt compelled to tender his resignation and not long afterwards was reported to be seriously ill. As our contemporary reports, he fought his illness with great courage but died at only 62.

In the field of organic chemistry Clough's name will never be forgotten although his brilliant researches were never rewarded, as perhaps they soon would have been had he not transferred his interests to a branch of veterinary science, by election to Fellowship of the Royal Society. As a toxicologist, however, his justifiably high reputation is not satisfactorily reflected in the literature and it would be virtually impossible to piece together from what he has left a proper symposium of his knowledge.

Of Clough's private life we know but little, except that he was happily married and lived quietly at Highgate, spending many hours by his fireside. His wife survives him. We who were his students will never forget the beautiful simplicity of his lectures or his analytical skill. Nor shall we forget his customary greeting to any of us in later years, aptly summarised by our contemporary as "Well! Well! It's Mr. —— [or Miss ——]. How are you getting on?"

MILKING MACHINES INCREASE

"In the last two years there has been a remarkable increase in the use of milking machines," states the Agricultural Correspondent of *The Times*, who continues: "The total for Britain is now 37,770, against 29,505 in 1942. This reflects farmers' difficulties in keeping milkers. On the larger farm the installation of a machine saves some time in milking and allows a reduced staff to manage at week-ends, but machine-milking does call for a high degree of intelligence and scrupulous cleanliness, otherwise there is trouble. The variable reputation of milking machines is mainly due to human frailties. On many dairy farms they give full satisfaction. The milkers like them and the cows do not suffer from mastitis or other troubles often attributed to machine-milking."

* * * * *

Weekly Wisdom

". . . Foreign policy, like charity, begins at home; unlike charity, it also ends at home. A Chatham or a Canning in our foreign relations started from, and returned to, the axiomatic principle that Great Britain stood irrevocably for free self-government; and that for her to concur in any departure from that principle, or assent to any arrangement which avowedly blocked its gradual realisation, was treason alike to the interests of Europe and treason to the historic mission of Great Britain, for which Europe and Great Britain would assuredly pay the penalty."—Sir Charles Grant Robertson, *England under the Hanoverians*, tenth edition, p. 475.

Victoria Veterinary Benevolent Fund

MEETING OF COUNCIL

A meeting of the Council of the Victoria Veterinary Benevolent Fund was held at No. 10, Red Lion Square, London, W.C.1, on Wednesday, April 25th, 1945, when the following members were present: Mr. Arnold Spicer (in the chair), Mr. J. K. Bateman, Professor J. B. Buxton, Mrs. D. I. Glover, Mr. S. Jennings, Capt. T. M. Mitchell, Lady Olver, Lt.-Col. P. J. Simpson, Major Henry Sumner, Professor G. H. Wooldridge, Dr. W. R. Wooldridge and Capt. W. G. Wragg.

The minutes of the previous meeting, having been published, were taken as read and signed as correct.

Secretary's Report

The Secretary submitted the following report, which was approved:—

Since the previous Quarterly Meeting of Council the following subscriptions and donations have been received.

Subscriptions (*new or increased*)

	£	s.	d.
J. K. Bateman	1	1	0
N. Ireland, V.M.A.	15	0	0
	£16	1	0

Donations

	£	s.	d.
In Memory of Lt.-Col. J. W. Brittlebank	55	10	0
In Memory of Herbert King	18	1	6
In Memory of W. S. King	48	17	0
In Memory of J. J. McDowell	7	4	6
Central Veterinary Society (C.B.)	5	9	10
J. L. Cormack (C.B.)	3	3	0
Derbyshire Veterinary Association (C.B.)	2	7	0
G. Dunn (non-member)	1	1	0
Eastern Counties V.M.A.	10	0	0
Major P. H. Hobbs	25	0	0
J. S. MacCann (Life member)	10	10	0
N. Ireland V.M.A.	6	10	0
Arthur Payne (Life member)	10	10	0
South Wales Division, N.V.M.A. (C.B.)	8	14	8
Stratford-on-Avon Fanciers and Domestic Livestock Club (per J. T. Morton)	2	2	0
Sussex Division, N.V.M.A.	3	0	0
V.M.A., Ireland, proceeds of Greyhound Meeting ...	166	4	1
Yorkshire Veterinary Society	3	3	0
	£387	7	7

Obituary.—The Secretary reported the death of Mr. W. S. King, a member of Council, and it was resolved: "That the condolences of the Council be conveyed to Mrs. King and family."

Cases

No. 231. Widow, aged 50. Under massage treatment. Earns £60 per annum, plus £20 towards education of son, aged 14. Present grant continued.

No. 234. M.R.C.V.S., aged 50. Unemployed. Correspondence was submitted and it was resolved that this grant be discontinued after the end of the present month.

No. 246. Widow, aged 63. Daughter, aged 28, earning £3 10s. per week as temporary civil servant. Recommendations were received from three members and the Executive Committee reported that they had made a provisional grant of £1 per week. The action of the Executive Committee was approved, the grant to be continued.

No. 247. Widow, aged 38. Two children, aged 16 and 13, at school. Consideration of this case was deferred for further information.

No. 248. M.R.C.V.S. Ill in hospital. Recommended by Irish Veterinary Medical Association. The Executive Committee reported that they had made a grant of £10 and a weekly grant of £1. The action of the Executive Committee was approved, the weekly grant to be continued.

No. 249. Widow, aged 58. Seven children, aged 10 to 21. Only one earning. Another son student at the Veterinary College. The Executive Committee reported that they had made a grant of £10 and a weekly grant of £1. The action of the Executive Committee was approved, the weekly grant to be continued. It was further resolved that this case be recommended to the National Veterinary Benevolent and Mutual Defence Society.

Life Members.—It was resolved:—

(*a*) That Messrs. A. Payne and J. S. MacCann be elected Life Members of the Fund.

(*b*) That in consideration of their generous donation of £50 to the Fund, Colonel Rees-Mogg and Mrs. Rees-Mogg be elected Life Members of the Fund.

Nominations to Council.—The Secretary reported the following nominations to the Council:—

By the Yorkshire Division, Capt. W. R. McKinna.
By the Lancashire Division, Major Henry Sumner.
By the Society of Veterinary Practitioners, Mr. S. Jennings.
By the Mid-West Division, Mr. Esmond Brown.

Annual Report.—The draft of the Annual Report and Statement of Accounts was submitted and approved for issue.

QUESTION IN PARLIAMENT

Veterinary Education

Sir G. Courthorpe asked the Minister of Agriculture whether he proposes to introduce legislation to give effect to the recommendations of the Chancellor Committee on Veterinary Practice by Unregistered Persons.

Mr. Hudson: The suggestion that unqualified veterinary practice should be the subject of special enquiry was one of a number of recommendations made by the Loveday Committee on Veterinary Education. The Chancellor Committee was appointed to make this enquiry and I welcome in principle the proposals made in its Report, recently published. The question of regulating unqualified veterinary practice is, however, bound up with the much wider recommendations of the Loveday Committee for improvements in veterinary education and for consequent modifications in the constitution and functions of the Council of the Royal College of Veterinary Surgeons. I do not think it would be desirable to introduce legislation on the subsidiary subject until it is possible to deal also with these larger issues along the lines recommended by the Loveday Committee.

LIVESTOCK POPULATION OF ENGLAND AND WALES

The final figures of agricultural production last year for England and Wales confirm the fact that the 1943-44 period marked the lowest point in the war-time decline of such stock as pigs and poultry, and that during last year there was a definite swing towards recovery in these classes of stock.

The total cattle population in 1944 continued steadily upwards. It was notable that cows and heifers timed for winter milk production showed the most marked rise in numbers. Even so, cows and heifers in milk at June last also showed a slight rise.

The cows in-calf rose from 524,000 to 536,000, while heifers in-calf rose from 628,000 to 635,000. The one class of stock which did not share in the general upward tendency in numbers was sheep. The total head of sheep for 1944 was 12,603,000 against 12,933,000 in the previous year. Ewe stocks share in this decline, as did all sheep under one year old.

In the case of pigs total numbers rose from 1,381,000 in 1943 to 1,461,000 in 1944, and the total for sows kept for breeding showed a striking advance of from 144,000 to 206,000 head. The most notable advance in this category relates to gilts in-pig whose numbers were fully doubled—from 31,000 in 1943 to 63,000 in 1944.

In the sphere of poultry, whilst the number of fowls from six months old declined slightly, the number under that age increased by fully 2½ million. Ducks, geese and turkeys all shared in this fairly substantial rise.

The horse population continued to decline.

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H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office.

	Price net s.	d.	*Post free* s.	d.
Public General Acts (Session 1944-45):				
Ch. 20. Colonial Development and Welfare ...	0	1	0	2
House of Commons Bills (Session 1944-45):				
47. Water. As amended by Standing Committee A	2	0	2	2

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

May 29th.—R.C.V.S. Council Election—Voting Papers to be returned.
May 30th.—Spring Meeting of the Eastern Counties Division, N.V.M.A., at Ipswich, 2 p.m.
May 30th.—N.V.M.A. Survey Sub-committee on Pig Diseases, 10.30 a.m.; Survey Sub-committee on Calf Husbandry and Calf Diseases, 2 p.m., 36, Gordon Square, W.C.1.
May 31st.—N.V.M.A. Survey Committee, 11 a.m., 36, Gordon Square, W.C.1.
May 31st.—Meeting of the Derbyshire Division, N.V.M.A., at Sutton Bonington, 2 p.m.
June 1st.—Resumed N.V.M.A. Survey Committee, 10 a.m., 36, Gordon Square, W.C.1.
June 5th.—Meeting of the V.V.B.F. Ladies' Guild, at 10, Red Lion Square, W.C.1, 2.30 p.m.
June 5th.—R.C.V.S. Council and Committee Meetings.
June 5th.—R.C.V.S. Annual General Meeting, 10, Red Lion Square, W.C.1, 12 noon.
June 5th.—V.V.B.F. Annual General Meeting, 10, Red Lion Square, W.C.1 (following above).
June 6th.—R.C.V.S. Committee Meetings.
June 7th.—Meeting of the Central Veterinary Society at the Veterinary Laboratory, Ministry of Agriculture, Weybridge, 2 p.m.
June 7th.—R.C.V.S. Council and Committee Meetings.
June 18th.—Meeting of the Overseas Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m.
June 27th.—N.V.M.A. Committee Meetings in Edinburgh: Sub-committee on First Aid Handbook, 10.30 a.m.; Organising, 12 noon; Appointments, 2 p.m.; Finance and General Purposes, 3 p.m.
June 28th.—N.V.M.A. Meetings in Edinburgh: Joint Parliamentary and Veterinary Officers and Public Health Committee, 10.30 a.m.; **Council Meeting**, 11.30 a.m.

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N.V.M.A. Meetings in Edinburgh

As announced above, meetings of the N.V.M.A. will be held in Edinburgh on June 27th and 28th, 1945. Members are urged to reserve rooms without delay as hotel accommodation is likely to be limited. Those who have difficulty and who would be willing to share a room should notify the General Secretary as soon as possible stating the dates on which they require accommodation.

The Principal of the Royal (Dick) Veterinary College has kindly given permission for members attending the meeting to use the College refectory for lunch on both days subject to advance arrangements being made. Will members who wish to take advantage of this please notify the General Secretary on or before June 15th.

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Refresher Tuition on Return from the Forces

The N.V.M.A. is anxious to do everything within its power to meet the demand for refresher tuition which is being made by veterinarians returning from the Forces. To this end it is proposed to compile a list of practitioners willing to give such tuition and to whom applicants who wish to receive such instruction—for example, in infertility problems—can be referred. Members who are prepared to assist in this matter are requested to send in their names to the General Secretary, N.V.M.A., 36, Gordon Square, London, W.C.1.

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PERSONAL

D.F.C. Award.—Flight-Lieutenant William Sproat Biggar, R.A.F., of the Northern Rhodesian Veterinary Department, has been awarded the D.F.C. for gallantry in operational service with Coastal Command. Flt.-Lt. Biggar, who has been serving with Coastal Command since 1942, qualified M.R.C.V.S. at Edinburgh in July, 1939, and also took the Edinburgh degree of B.Sc. (Agric.).

Appointment.—Mr. E. J. H. Ford, B.V.Sc., M.R.C.V.S., only son of Mr. Edwin Ford, 54, Sandygate Crescent, Wath, has received an appointment as Veterinary Research Officer at Durham University. Mr. Ford, an old boy of Wath Grammar School, is a graduate of Liverpool University.

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Forthcoming Marriage.—Wood—Robins.—The engagement is announced between Lt. John C. Wood, B.V.Sc., M.R.C.V.S. (Liverpool), only son of Mr. and the late Mrs. S. Wood, of Clitheroe, and Jean, only daughter of Mr. and Mrs. H. S. Robins, Alderley Edge, formerly of Clitheroe.

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R.C.V.S. OBITUARY

Ferguson, Alexander Edward, Bryn Siriol, Merthyrmawr Road, Bridgend, Glam.; Divisional Inspector, Ministry of Agriculture and Fisheries. Graduated Edinburgh, July 17th, 1922. Died May, 1945.

McNae, Alexander, Capt. late S.A.V.C., 5, Dudley Road, Parkwood, Johannesburg, Transvaal, S. Africa. Graduated N. Edinburgh, May 30th, 1899. Died April, 1945; aged 68 years.

Mr. Alexander E. Ferguson, M.R.C.V.S.

Mr. A. E. Ferguson, M.R.C.V.S., whose death we record above with much regret, had been in South Wales for the past ten years, and took up his present appointment in 1938. He was President of the South Wales Division, N.V.M.A., and Past-Chairman of the Mid-Glamorgan Scientific Society.

The funeral took place from his parents' house, 65, Redford Avenue, Colinton, Edinburgh, on Monday, May 14th, and afterwards at Piershill Cemetery.

The service both at the house and at the graveside was attended by a large number of relations and friends. Members of the profession present were Major D. S. Rabagliati, representing the Association of Veterinary Inspectors of the Ministry of Agriculture and Fisheries: Mr. S. Sharp, representing the South Wales Division of the National Veterinary Medical Association; Mr. T. Bannatyne and Mr. W. A. Ireland.

Mr. Alexander McNae, M.R.C.V.S.

Mr. McNae was born at Maxwelltown, Dumfriesshire, his father being a veterinary surgeon who practised at Maxwelltown, Dumfries. He served through the Anglo-Boer War with the I.L.H., and took part in the East African campaign during the last war. Subsequently he entered the Government veterinary service in the Transvaal.

For several years he was manager of the Government Stud Farm at Standerton and later became Senior Government Veterinary Officer in South-West Africa.

On retiring on pension eight years ago, he joined Major F. C. Gavin, D.S.O., in partnership as veterinary officers to various Rand racing clubs.

Mr. McNae was buried on April 3rd, after a service at Braamfontein Crematorium. He had some heart trouble said to have been contracted during the campaign in German East Africa. He is survived by his widow and a young son.

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ADDRESSES OF DISEASE-INFECTED PREMISES

Foot-and-Mouth Disease:

Merioneth.—Pendre Piggery, Bryncrug Road, Towyn (May 17th).

Swine Fever:

Essex.—Ismay Canteen Pig Club, Roden Street, Ilford (May 15th).
Glos.—Parkend Farm, Moreton Valence, Gloucester (May 17th).
Hunts.—Bottom Lodge Farm, Sawtry (May 19th).
Norfolk.—Allotment Premises, Morston Road, Stiffkey, Wells (May 19th).
Somerset.—Manor Farm, West Newton, North Petherton, Bridgwater (May 18th).
Stirlingshire.—No. 1 Holding, Barraston, Torrance of Camsie (May 19th).
Suffolk.—Kettles Corner Farm, Cretingham, Woodbridge (May 15th); Common End Farm, Broad Street, Bungay (May 16th).
Wilts.—36, Malmesbury Road, Leigh, Swindon (May 19th).
Yorks.—Park Lane Allotments, Guisborough; Springfield Farm, Sherburn-in-Elmet, South Milford (May 16th); Newton Picket, Londonderry, Northallerton (May 19th).

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In view of the continued high incidence of foot-and-mouth disease, it is of the utmost importance that all should exercise the greatest care in personal disinfection when visiting farm livestock for any purpose, and report immediately the slightest suspicion of the existence of any illness having the remotest resemblance to foot-and-mouth disease.

R.C.V.S. ANIMAL MANAGEMENT EXAMINATION

List of Successful Candidates

(*Continued from page* 239)

Liverpool:

Allcock, James
Aston, K. R.
Barlow, Miss B. J.
Bleasdale, C. R.
Clark, W. A.
Carter, N. S.
Field, A. C.
Gee, Miss B. G. (Credit)
Greasley, John (Credit)
Griffiths, Laurence
Hill, K. J.
Harrison, W. J.
Jones, R. G.
MacDonald, J. N.
Morris, John
Morten, D. H.
Myerscough, S. F.
Nicholson, Miss E. M.
Pink, C. E.
Scarnell, John
Sinclair, K. B.
Swire, P. W.
Watkins, I. M.

Edinburgh:

Auchnie, J. A.
Blythman, W. G.
Brotherton, P. N.
Caird, Miss E. A. Y.
Copland, Miss E. A.
Evans, G. J.
Faulkner, J. T.
Jones, E. E.
McCully, W. H. (Credit)
Millar, Miss M. E.
Mitchell, K. S.
Pette, F. D.
Preston, Miss A. C.
Thomas, W. U.
Walker, Charles
Walker, Denis

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Veterinary Services in Eire

Proposed Scheme of Reorganisation

Extensive reorganisation of the veterinary services is recommended in the recently issued report on veterinary services of the Committee on Post-Emergency Agricultural Policy. This is the third interim report of the Committee, and deals exclusively with veterinary matters. The main purpose is to reduce the losses due to various livestock diseases.

The chief proposals are for the co-ordination of all veterinary services and their control by the Minister for Agriculture; the appointment of a Director of Veterinary Services; the establishment of a Veterinary Research Council and a Research Institute to replace the laboratory at Thorndale, Dublin. All creameries, it is also recommended, should be required to install pasteurising plant; tuberculin-testing be provided for farmers, free of charge, and there should be ten local veterinary laboratories through the country.

In its proposal for unification under the Minister, the Committee finds that efficient and economical service cannot now be given. Administration of public health legislation regarding veterinary examination of meat and milk should be brought under the Minister, thus unifying all State veterinary services. This step would facilitate transfer of officers from one set of duties to another as circumstances demanded and so make for improved proficiency and greater economy.

Establishment of a suitable liaison between the L.G.D. medical advisory section and the Department of Agriculture veterinary branch would be necessary. For efficient direction and co-ordination of the veterinary services, a Director of Veterinary Services should be appointed who would have the status of an assistant secretary. He would be in charge of all veterinary services, including those relating to education and research, and his special province should be the direction of all measures designed to control and eradicate livestock disease.

As essentials of disease control, the Committee specify education of stock-owners in proper methods of nutrition and veterinary hygiene and in simple methods of diagnosing and treating certain ailments; location of veterinary surgeons so that every farmer might have available professional service at reasonable cost; country-wide measures to deal with the principal endemic diseases.

As an example of the need of the latter, the report says that vaccination against contagious abortion would, in view of the constant movement of animals and the ease with which infection is spread, be of limited success unless adopted universally.

The system whereby a number of veterinary surgeons are employed by local authorities should be replaced by a co-ordinated scheme under which veterinary practitioners should be employed part-time for not only existing duties under animal disease and public health legislation, but also specific duties designed to reduce diseases. The country should be divided into districts on the basis of livestock population density, a veterinary surgeon be allocated to each and required to live at a convenient centre.

The work of these part-time officers would include education of stock-owners in preventive and control measures and in treatment: tuberculin testing; vaccination against contagious abortion and of sheep, lambs and cattle against other diseases.

These part-time officers would get a salary of £300, rising to £500 a year and be free to augment this by private practice. Appointment of a number of full-time supervising veterinary officers is recommended, ten at the beginning, and each would have an area comprising the districts covered by about 20 part-time officers.

Vaccination charges suggested are 6d. an animal in the case of contagious abortion and blackleg, and 3d. in the case of braxy and louping ill, vaccination against remaining diseases 1s. a beast and 6d. a sheep, subject to a minimum charge of 10s. a visit.

The report says that 200 veterinary officers would be available at the outset for employment under the scheme, and envisages its extension until 400 are employed.

Each local laboratory would be staffed with a veterinary surgeon trained in laboratory technique, specially qualified in poultry diseases, able to do milk bacteriological tests, and assisted by one or more trained lay laboratory technicians.

Poultry instructors should receive intensive short courses on poultry diseases from veterinary specialists. The number of instructors should be substantially increased.

Bovine Tuberculosis

Stressing the seriousness of bovine tuberculosis, it is proposed that tuberculin testing should be free to farmers. Until stock-owners become alive to the highly infectious nature of this disease and take the necessary measures, there will be little prospect of any appreciable reduction in incidence. Importance of proper housing should be emphasised.

Creameries should have to install plant for pasteurisation of separated milk. Farmers who do not send to creameries and who have no guarantee that the milk is free from tuberculous infection should be exhorted to have it boiled before feeding to stock.

The report proposes a policy of eliminating clinically affected cases of tuberculosis (those most likely to be spreading infection) as rapidly as possible, of reinforcing this by building up tuberculosis-free herds and of proceeding gradually towards the complete elimination of the disease, area by area. The Bovine Tuberculosis Order should apply to all animals affected, and full market value should be paid in compensation for all clinically examined animals not in the advanced stage.

As an inducement towards building up tubercle-free high-class herds, 2d. a gallon subsidy should be paid for milk produced by cows registered under the Department's scheme for their Registration of Dairy Cattle (Pedigree and Non-Pedigree), and which are in herds certified tuberculosis free. The scheme would not cost more than £15,000 yearly at first.

When accurate information is available as to the number of infected animals in each area, and when incidence has been reduced in particular areas to a point at which compulsory slaughter would be feasible, a compulsory eradication scheme should be at once introduced in such areas.

Veterinary Training and Research

The Committee finds that the clinical training of veterinary students could be very materially improved.

Another recommendation favours the setting up of a panel of suitable practising veterinary surgeons, with whom students would be obliged to take their apprenticeship. Entrance to the Veterinary College should be by the open competitive examination of a standard equivalent to the secondary schools' leaving certificate. There should also be an oral examination in which students would be tested for special qualifications, including knowledge of livestock husbandry.

The National University and Trinity College, Dublin, should be invited to regard the M.R.C.V.S. diploma as an *ad eundem* degree and to introduce other veterinary science degrees open to students who have attained honours in the M.R.C.V.S. diploma examination and are specially recommended by the principal. Travelling studentships should be provided for selected M.R.C.V.S. diploma holders.

An important recommendation in relation to veterinary research is that the existing laboratory premises and farm at Thorndale as well as the State farm at Lusk should be vacated; that a farm of not less than 200 acres be acquired as near as possible to Dublin on which a Veterinary Research Institute would be built. There should be full collaboration between the Veterinary College and the Institute.

A Veterinary Research Council is proposed. It would direct research policy; advise on the appointment of research personnel; make recommendations as to allocation of grants to independent research workers and on the sending of veterinarians abroad to study. Its personnel would be the Director of Veterinary Services, Chief Research Officer, Agricultural Director, Department of Agriculture: Veterinary College head, and two members of the Veterinary Medical Association.

The Committee is satisfied that many patent medicines are of no value for the treatment of disease, while others are "merely common inexpensive drugs sold under impressive names at exorbitant prices."

It is recommended that all manufacturers, importers and vendors be licensed under conditions determined by the Minister.

The Committee's proposals involve a £90,000 estimated capital outlay and an estimated increased annual expenditure of £115,500.

In a reservation, Mr. R. C. Barton says that decentralisation of laboratory work in a small country would not provide improved services to compensate for loss of efficiency and the additional cost occasioned thereby.

A minority report by Dr. H. Kennedy stresses the need for the farmer and veterinarian acting in partnership. This, he says, is incompatible with the dependence of the veterinary surgeon on private practice.

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SCOTLAND'S AGRICULTURAL COUNCILS

Secretary of State Proposes Amalgamation

"Changes in the advisory machinery available to the Department of Agriculture for Scotland are proposed by the Secretary of State for Scotland," says *The Scottish Farmer* in its issue of May 12th, and continues: "The two bodies particularly affected by the proposal are the Agricultural Advisory Council for Scotland and the Agricultural Improvement Council.

"The Agricultural Advisory Council was set up by the late Sir Godfrey Collins, when Secretary of State, to place at the Department's service a body of practical agriculturists for confidential consultation on matters of policy or administration. Meeting several times a year, it has given valuable advice and assistance on current questions. No time limit was set to the term of office of members, and most of the original appointees are still members.

"Agricultural Improvement Councils were set up both in England and Scotland in 1941 to consider ways and means of getting the results of research across to the farming community and to make recommendations to the Department and the Agricultural Research Council for research work. The Scottish Council was largely constituted of bodies interested in these purposes, such as the Agricultural Colleges, the Agricultural Research Council and the Department.

"In view of the growing importance of full and close co-ordination between research and education work on the one hand and the development of general agricultural policy on the other, amalgamation of the two Councils into one Advisory Council is proposed. The change has the approval of both the existing Councils, and the members of the Advisory Council have indicated their readiness to retire to facilitate the reorganisation. The term of office of members of the Improvement Council expires in June, 1945.

"The names of members of the new Council and of a Standing Committee which will handle purely technical matters, will be announced later. It is proposed to constitute the new Council on a basis which will give opportunities for new members to be appointed from time to time."

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THE VETERINARY EDUCATIONAL TRUST

Profession as the Ally of the Agriculturist

The importance of the veterinary surgeon as the ally of the agriculturist was stressed at a luncheon given by the Mayor of Southampton (Councillor J. C. Dyas) in honour of the Duke of Beaufort, Chairman of the Livestock Industry Committee of the Veterinary Educational Trust, states *The Southern Daily Echo* in its issue of May 4th.

Presiding over the luncheon, which followed a reception at the Civic Centre, the Mayor commented that the Duke's knowledge of farming and its problems was first hand, for he was a practical agriculturist.

Southampton was in the centre of an important agricultural community, and it was fitting that the town should give a lead to other towns in comparable circumstances by showing its interest in the work which the Duke and his colleagues were undertaking for the ultimate benefit of agriculture. It was upon that industry that the well-being of the country depended to an ever-increasing degree.

Commenting that there were many things of which Britain could be proud, the Duke said that one thing about which there could be no pride was the state veterinary education and research were in before the war and until the founding of the Veterinary Educational Trust.

It was vitally essential to maintain the standard of our oldest and greatest industry, agriculture, not only in our own interests but in those of our colonies and in the interest of our relations with other great Powers. The industry would benefit by the work of the Trust which, since it began its activities two years ago, had raised £200,000 on its capital account. Some 20 scholarships and fellowships had been made available. The sister committee, the Bloodstock Industry Committee, had raised a fund of £62,000 and was in the enviable position of securing an annual income of five to six thousand pounds by a system of auctioning nominations given by the owners of well-known stallions during the Newmarket Bloodstock Sales. If the bloodstock industry was so keenly alive to the benefits of research it was reasonable to suggest that those concerned with livestock should be equally interested. "As practical agriculturists we know how important to our interests is veterinary research," added the Duke in listing some of the diseases which urgently needed technical investigation. All experience in research had shown the need for continuity in each and every field of research and it would be a calamity if the long-term plans of the Trust should fail to fructify through lack of funds.

Mr. F. R. Alderwick, President of Southampton Chamber of Commerce, supported the objectives of the Trust.

As the Duke of Beaufort had done in his speech, Mr. J. Fawcett, Chairman, Hampshire branch, National Farmers' Union, disagreed with Lord Listowel's recent criticism of the health of British livestock, but said that there were still diseases that were having disastrous effects upon herds. He hoped that farmers would support the Trust more than they had done so far.

Dr. W. R. Wooldridge, Chairman of the Council of the Trust, declared that agriculture, Britain's greatest industry, would be even greater after the war. Before the war it had a turnover of between two and three million pounds a year, but it was estimated that disease cost £30,000,000 a year. In the words of a Government report, "veterinary education has been starved." In veterinary surgery there were keen and capable men eager to teach, but the tools were lacking. He could not help reflecting what a proportion of the money contributed towards charities for animals might do if devoted to veterinary research. The veterinary profession should be put on a par with medicine so far as teaching was concerned.

Mr. F. S. Thatcher suggested that it might be possible to start a public subscription list covering the whole of Hampshire.

Alderman F. Woolley saw in the Trust one of the most hopeful things that had happened to agriculture for a long time. It was astounding to what lengths some farmers would go in the matter of quackery.

The Mayor announced that he had received a telegram from Mr. Walter Hutchinson, the publisher and well-known breeder of shorthorn cattle, stating that he intended to support the Trust to the extent of £1,500.

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Award of Two Cooper Centenary Fellowships

The Veterinary Educational Trust announces that Cooper Centenary Fellowships have been awarded to Mr. J. F. A. Sprent, B.SC., M.R.C.V.S., and Mr. J. Hobart, B.SC.

The Fellowships are established with the Trust by Messrs. Cooper, McDougall and Robertson to assist in the development of veterinary parasitology and also as a mark of the centenary of that company. They are normally tenable for one, two or three years, depending upon satisfactory progress in the research undertaken.

Mr. Sprent qualified as a veterinary surgeon at the Royal Veterinary College in 1939 and took a B.Sc. degree in Zoology with First Class Honours at Birkbeck College in 1942. Since then he has been a Veterinary Research Officer in the Colonial Veterinary Service, stationed at Vom, Nigeria, where he has carried out important investigations upon helminth infestation of cattle in that country. He hopes to continue to work upon helminth infestations of domestic animals with particular reference to host resistance and the development of a host immunity.

Mr. Hobart took a B.Sc. degree in Zoology with First Class Honours in 1943 at University College, London. He has been a Demonstrator in Zoology at University College, North Wales, and has carried out research upon the ecology of adult sheep blowflies in North Wales. His field work has comprised the trapping of flies in the field and the study of the Dipterous succession in small carcases. This work was commenced in collaboration with the A.R.C. Entomological Unit. Mr. Hobart proposes to continue his field work in North Wales and to work upon the physiology of insects at the London School of Hygiene and Tropical Medicine.

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VETERINARY CENTRE FOR TOBERMORY

Following representations by the Mull branch of the National Farmers' Union of Scotland and the Argyll County Council, the Department of Agriculture for Scotland have agreed to set up a veterinary centre at Tobermory under the Highlands and Islands Veterinary Service Scheme for the islands of Mull, Coll and Tiree. The Department have offered a grant of £300 per annum to the County Council towards the salary of a resident veterinary surgeon, and have asked the County Council to recommend a suitable surgeon for their approval.

The Department have also decided that the Morven district should continue to be served from Inverness-shire.

MINISTRY OF AGRICULTURE NEWS SERVICE

Water Supply on Dairy Farms

An adequate supply of pure water is essential for dairy farms and the scarcity experienced in some country districts is a great handicap. As a rough guide to water requirements it is worth while to remember that a cow will drink approximately eight gallons a day for maintenance and a further two or three gallons for each gallon of milk produced; cooling may take five or six gallons of water for each gallon of milk; and cleansing some ten gallons per cow. Thus a daily supply of approximately 30 gallons per cow is desirable. This quantity may be reduced by double usage of the cooling water. Water should be laid on to the cow-house and to the dairy for the milk room and the washing and sterilising room. Taps with hose connections should be placed at convenient points in the cow-house and basins should be provided for milkers to wash their hands.

A main water supply has many advantages. In hot weather, however, the temperature of main water may be somewhat high for the satisfactory cooling of milk; therefore, if well water of suitable purity is also available it should be used for cooling. Shallow well water in certain parts of the country is apt to fluctuate in quantity, and is for this reason often less efficient, while great care is necessary to avoid surface contamination. Deep well water, *i.e.*, water drawn from beneath impervious strata, is generally suitable as it is more likely to be free from contamination and is uniformly low in temperature, an advantage when used for cooling the milk.

Where water for cooling has to be pumped to a storage tank, arrangements should be made so that the period of storage before cooling can be reduced to a minimum and the tank easily kept clean and provided with a cover.

It is an economy if water that has passed through the cooler is made available for further use either for washing the cows or cow-house or for watering the stock. Similar use may be made of rain water collected from the cow-house and adjacent buildings and stored in covered tanks. With a main water supply, double usage of the cooling water is made easier by arranging for the water that has passed through the cooler to flow to a storage tank raised to about 7 ft. above floor level and large enough to hold the cooling water from two successive milkings. Care must be taken to prevent pressure of water damaging the cooler.

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Washing-up in the Dairy.—Washing-up is a distasteful job, but it is one that must be done and done well, especially in the farm dairy, where neglect of elementary precautions can lead to the loss of many gallons of milk, the priority food of the nation. Cleanliness of milk vessels and the keeping quality of milk are very closely connected. If more care were expended in their washing, less sour milk would be returned to farms and fewer samples would fall into category "C" under the National Milk Testing and Advisory Scheme. The farm with ideal buildings does not necessarily provide the cleanest milk, which is often produced by farmers working under less favourable conditions but who take scrupulous care in every phase of milk production. This applies especially to the sterilising of all utensils that come into contact with milk.

Cleaning dairy equipment should commence immediately after milking; if left until the film of milk has dried, both time and efficiency are lost. The preliminary washing in clean cold water should be thorough. Utensils should then be washed and scrubbed in really hot water to which a detergent has been added. A detergent is not a disinfectant, it is a grease and dirt remover, such as washing soda, soda ash or one of the many proprietary powders on the market. After this washing the utensils should be rinsed with clean water, either hot or cold. Finally they should be sterilised in boiling water or preferably by steam. If a steam steriliser is not available then the articles must be allowed to remain completely immersed in a copper of boiling water for at least two minutes. All utensils should be allowed to dry of their own accord. If wiped with a cloth they are likely to become recontaminated. Any cloths used for washing purposes should be boiled regularly in water to which soda has been added. Churns must be kept clean and, by utilising a special form of lid, they can be steam sterilised after washing by inverting over a copper of boiling water until every part of the churn is too hot to touch with the hand. Clean utensils should be stored in a clean place, preferably the sterilising chest or milk room, until required for the next milking.

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Agriculture in Secondary Schools.—"The prosperity of the agricultural industry, which is one of the main aims of His Majesty's Government in the field of home policy, will depend largely on its efficiency, and this in turn will depend largely on the efficient training of its workers," say the Ministers of Education and Agriculture in a foreword to the first Report (recently published) of the Joint Advisory Committee on Agricultural Education in Secondary Schools, which is commended to the careful consideration of those concerned with the problem of devising a more suitable form of education for boys and girls who will find their living on the land.

The Committee points out in the report that, while technical schools in towns offer pupils of a practical turn of mind courses designed to prepare them for employment in urban trades, over the country as a whole no corresponding provision is at present made preparatory to employment in agriculture and the rural crafts. But country children are entitled to equal educational opportunities with town children, and agriculture must have its fair share of the abler and more intelligent pupils passing through the secondary schools. The Report recommends that, in addition to the general adoption in country secondary schools of a rural bias in education, a more advanced course of training should be provided, as an alternative to the traditional grammar school training for the professions, for the abler boys and girls with a practical bent who may wish to enter agriculture or the rural industries.

In advocating "pre-agricultural" courses in secondary schools it is not the idea of the committee that boys and girls between the ages of 15 and 16 should be turned out as partially trained farmers or farm workers. The object is to fit those who will in future hold responsible posts in the agricultural industry to be intelligent, useful and happy members of the rural community, whilst not rendering them unfit for non-agricultural careers.

The Report outlines a course designed to keep a fair balance between practical and theoretical work and between "vocational" and "general" subjects, with the object of providing a good education, congenial to the rural environment but not unduly specialised. Boys and girls so educated would be well fitted to acquire practical skill in their working life, to rise above rule-of-thumb methods, to adjust their practice to changing conditions and to keep a receptive attitude of mind towards technical advice. Those who later passed on to a farm institute or a centre of higher agricultural education would be able to get the full benefit of the technical training which they would receive there without wasting time on elementary subjects that should have been learned at an earlier stage in their education.

Under the title, "The Provision in Secondary Schools of Courses Preparatory to Agricultural Employment," the report is published by H.M. Stationery Office, York House, Kingsway, London, W.C.2, and is available there or through any bookseller, price 3d. net.

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Dairy Farmers' Good Work.—At the beginning of the winter milk campaign in 1941-42, winter milk sales through the Milk Marketing Board in England and Wales were 461 million gallons. For the winter months of 1944-45 sales amounted to 535 million gallons. Dairy farmers in England and Wales can, therefore, claim to have made available during the past three winters an additional 74 million gallons of milk. This is equal to 2·8 million gallons per week, most of which has been taken up by priority consumers.

Much of this substantial increase in winter milk is due to the success attending the efforts of dairy farmers during the past three years in turning over from spring to autumn calving, a success achieved last winter despite a bad harvest in 1944 and a severe winter. With better conditions the figure would probably have been considerably higher.

The increased supplies of winter milk have come from all parts of the country. A comparison of winter milk production in 1941-42 with 1944-45, in the Milk Marketing Board's eleven regions, shows increases varying from 5 to 38 per cent. A low percentage increase, however, does not mean a poor effort. Certain areas have always been winter milk producers, as in the case of the South Eastern Region where an increase of 5 per cent. is a good figure. Other percentage increases are, North Wales 38, Northern Region 26, South Wales 22, West Midland 20, Far Western 17, North Western and East Midland both 16, Mid-Western 13, Southern 12.

British dairy farmers and their workers, not forgetting the Women's Land Army, have, by their unremitting efforts, enabled priority consumers to obtain a greater ration of milk than would otherwise have been the case.

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Johne's Disease.—Johne's disease, which is a serious menace in many herds and causes violent scouring and loss of condition, is spread by the contamination of water, foodstuffs and pasture land, by the faeces of infected animals. One difficulty in controlling the disease is the length of time for which the disease organisms survive outside the animal's body.

With ordinary weather conditions, Johne's bacilli will remain active in infected faeces for more than eight months. In one case the bacilli survived from October to June and in another from December till the end of June, despite the wide variation in temperatures to be expected over such a long period. The indications are that Johne's bacilli survive longer in a sample that is kept moist than in a duplicate in which the sample is allowed to dry.

This all points to the fact that infected pastures, that is fields fouled by the droppings of infected animals, should be regarded as unsafe for a year. If a pond is in the pasture, it should be drained

or fenced off. Infected manure from standings should not be put on to pasture land where animals susceptible to Johne's disease might be grazed. An animal may pick up infection at an early age.

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"A SHEPHERD'S LIFE"•

"Fifty years," he said, "I've been on the downs and fields, day and night, seven days a week, and I've been told that it's a poor way to spend a life, working seven days for ten or twelve, or at most thirteen shillings. But I never seen it like that; I liked it, and I always did my best. You see, sir, I took a pride in it. I never left a place but I was asked to stay. When I left it was because of something I didn't like. I couldn't never abide cruelty to a dog or any beast. And I couldn't abide bad language. If my master swore at the sheep or the dog I wouldn't bide with he—no, not for a pound a week. I liked my work, and I liked knowing things about sheep. Not things in books, for I never had no books, but what I found out with my own sense, if you can understand me.

"I remember, when I were young, a very old shepherd on the farm; he had been more'n forty years there, and he was called Mark Dick. He told me that when he were a young man he was once putting the sheep in the fold, and there was one that was giddy—a young ewe. She was always a-turning round and round and round, and when she got to the gate she wouldn't go in but kept on a-turning and turning, until at last he got angry and, lifting his crook, gave her a crack on the head, and down she went, and he thought he'd killed her. But in a little while up she jumps and trotted straight into the fold, and from that time she were well. Next day he told his master, and his master said, with a laugh, 'Well, now you know what to do when you gits a giddy sheep.' Some time after that Mark Dick he had another giddy one, and remembering what his master had said, he swung his stick and gave her a big crack on the skull, and down went the sheep, dead. He'd killed it this time, sure enough. When he tells of this one his master said, 'You've cured one and you've killed one; now don't you try to cure no more,' he says.

"Well, some time after that I had a giddy one in my flock. I'd been thinking of what Mark Dick had told me, so I caught the ewe to see if I could find out anything. I were always a terrible one for examining sheep when they were ill. I found this one had a swelling at the back of her head; it were like a soft ball, bigger'n a walnut. So I took my knife and opened it, and out ran a lot of water, quite clear; and when I let her go she ran quite straight, and got well. After that I did cure other giddy sheep with my knife, but I found out there were some I couldn't cure. They had no swelling, and was giddy because they'd got a maggot on the brain or some other trouble I couldn't find out." . . . "I don't say that I want to have my life again, because 'twould be sinful. We must take what is sent. But if 'twas offered to me and I was told to choose my work, I'd say, Give me my Wiltsheer Downs again and let me be a shepherd there all my life long."

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THE MOST IMPORTANT DRUGS

In 1910 the following drugs, in the order given, were listed by United States physicians as the most important: (1) ether, (2) morphine, (3) digitalis, (4) diphtheria antitoxin, (5) smallpox vaccine, (6) iron, (7) quinine, (8) iodine, (9) alcohol and (10) mercury.

This year the editor of the *Journal of the American Medical Association* (March 10th, 1945, p. 593) asked professors of medicine in teaching medical schools to state the ten remedies which in their opinion were the most important or useful. From the replies to the question the following list was compiled: (1) Penicillin and the sulphonamides and antibiotics. (2) Whole blood, blood plasma and blood derivatives. (3) Quinine and quinacrine. (4) Ether and other anaesthetics, morphine, cocaine and the barbituric acid derivatives. (5) Digitalis. (6) Arsphenamines. (7) Immunising agents and specific antitoxins and vaccines. (8) Insulin and liver extract. (9) Other hormones. (10) Vitamins.—*Pharm. J.*

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Mr. Marvin Jones, United States War Food Administrator, in announcing final agricultural production goals for 1945, called for a larger slaughter of cattle to meet increased military and civilian demands. The cattle and calf slaughter suggested by the W.F.A. was 35,000,000 head, an increase over the 33,900,000 in 1944. State recommendations called for an increase in the goal for spring pigs from 55,925,000 in 1944 to 57,563,000. The W.F.A. had suggested 57,000,000. Farmers were urged to keep more sows for spring farrowing to help meet the goal.—*Meat Trades Journal.*

• "Caleb," from "A Shepherd's Life," by W. H. Hudson.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

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R.C.V.S. COUNCIL ELECTION

Sir,—I was both interested and intrigued by the letter from E. P. Edwards in the current number of *The Veterinary Record*, cleverly written and well timed as one would expect from that experienced politician, but I challenge the wisdom of his advice. Is the issue so clear cut, and do the addresses of the candidates mean such a lot, I wonder? Surely the profession might be better served by an individual whose ability and integrity were beyond question, even if that individual's views were not 100 per cent. one-portal, than by a person whose only claim to a seat on the Council was that he was a die-hard one-portalist.

I have known members who, outside the Council Chamber of the R.C.V.S., were vociferous uniportalists, but who inside the Council Chamber became imbued with a spirit of sweet reasonableness and on closer examination of the question were willing to become multiportalists—on conditions.

Mr. Edwards says "Our opponents . . . appear to have nominated eight candidates for the eight seats"; he must have inside information as to who these eight are. I have read through the election addresses and I have scanned the official list of nominees with their proposers, and I confess that if I was to be guided only by Mr. Edwards' advice I would be at a loss to know for whom I ought, or ought not, to vote. Take, for example, one of the candidates—H. Gillmor, of Ayr—he has not seen fit to publish an election address—and having read all the others, I do not blame him! I have no idea whether he is uniportal or multiportal, nor do I care, but I know him to be a most able practitioner, always ready to lend a helping hand to others; a man possessed of the highest ideals, loved and honoured by all who know him—altogether a worthy representative. Yet Mr. Edwards would not give Mr. Gillmor "the benefit of the doubt" because he has not avowed himself to be a one-portalist!

However, I echo Mr. Edwards' appeal to members to "Vote, Vote, Vote, so that the will of the whole profession may be made manifest"—but I would plead that however they vote their decision should be based upon reason rather than shibboleth.

Yours faithfully,

28, Lichfield Street, H. W. Steele-Bodger.
Tamworth, Staffordshire.
May 19th, 1945.

. . . . .

Sir,—Having been compelled to abandon his original claim that the recommendations of the Second Report of the Committee on Veterinary Education in Great Britain, of which he himself was a member, did not in fact abolish the one-portal system of entry into the profession in this country, Dr. W. R. Wooldridge returns to the subject, in your issue of May 19th, by attempting to confuse the issue as regards the facts by mixing them up with his opinions.

The question of fact to be decided by the electors is: will the R.C.V.S. continue to be in sole control of the veterinary profession or not?

Dr. Wooldridge, apparently, holds the *opinion* that if this sole control is swept away it will facilitate the advancement of veterinary knowledge and practice; but this is only the persuasion of his mind without any proof or certain cognisance, and it does not in any way alter the *facts* which are at issue in this election.

I repeat them. They are: whether or not the R.C.V.S. is to remain as the one and only body capable of exercising control over the teaching of veterinary medicine and surgery, examining in these subjects, and issuing registrable qualifications entitling their holders to practise.

Yours faithfully,

23, Queen's Gate Gardens, Thomas Lishman.
London, S.W.7.
May 20th, 1945.

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VETERINARY EDUCATION

Sir,—Whilst many members of the profession believe that the time has come for further changes in our methods of education and perhaps even the adoption of a multi-portal system of entry, there is in my view no justification for the ill-founded jibes and criticisms which "1944 graduate" has made against his new profession. It is difficult to know how he concludes from the Register that the R.C.V.S. examinations provide such a "coarse filter," because most examinations and courses of study are described in much less detail. He claims to belong to the one group who has a "living clear and detailed view of the whole process" of examination, and

wonders how many of the verbose supporters of our present system have read the details of the examination syllabus which are given in the Register, and then goes on to say that students are not satisfied with having the knowledge of a year's work judged by a mere four half-hour questions. If he himself examined the Register a little more carefully he would find that on the average there are, at the end of each year, six hours of written examinations and four hours of oral and practical—not just two hours of written examinations.

If he carried his researches a little further he would find that the veterinary profession has always, as now, been attempting to improve the educational standard of its students and that practitioners, despite other claims on their time, have taken an extraordinary interest in the subject. He would also find that all other groups of students, particularly medical students, are equally dissatisfied with their educational and examination systems. The following statement is made in a leading article dealing with medical education in the *Lancet* of August 30th, 1941: "It is not our duty . . . to give praise or blame, to bring any of the agents to judgment, but rather to find out by patient enquiry how the pre-war curriculum came to be the poor frustrated thing it was and to share in the glorious task of infusing new life into the old framework. It is time to make changes." This hardly expresses great satisfaction with medical education and it is well known that the Goodenough Committee recommended sweeping changes.

He claims that in the M.R.C.V.S. examinations the "orals" are sinking to the status of "checking up" on borderline students; yet, unless there has been a change in recent years, he will remember that in the first B.Sc. (Vet. Sci., Lond.) examination of which he approves, there was no oral examination and he never even saw any one of the examiners. He further states that the many faults of the B.Sc. examinations revolve round the use of internal examiners, whereas at the end of his letter he advocates more power for internal examiners in the R.C.V.S. examinations.

During my period as a student several university graduates joined the College and in contrast to the friends of "1944 graduate" they expressed surprise at the amount of work they had to do to pass examinations and the number of subjects covered; some of them failed our examinations and it is notorious that there are universities where a man of moderate intelligence can obtain a degree by doing the very minimum of work.

In my view it is desirable that the universities should play a larger part in veterinary education, but it is a mistake to think that residence in a university will *necessarily* produce good veterinarians. It will inevitably require years of hard work before the standard of veterinary education at any new university school is very high. T. H. Huxley once remarked that "there is no position so ignoble as that of the so-called 'liberally educated practitioner,' who, as Talleyrand said of his physician, 'knows everything, even a little physic'; who may be able to read Galen in the original; who knows all the plants, from the cedar of Lebanon to the hyssop upon the wall; but who finds himself, with the issues of life and death in his hands, ignorant, blundering and bewildered, because of his ignorance of the essential and fundamental truths upon which practice must be based."

Huxley, who can hardly be accused of a narrow professional outlook, also refused to allow his school (The Royal, now The Imperial, College of Science) to be incorporated in the University until suitable terms, including the setting of its own examinations which entitled students to university degrees, were granted.* There has been a full and free debate on the second Loveday Report and I would submit that the letter from the R.C.V.S. to the Minister of Agriculture expresses the considered views of the vast majority of the profession; it should therefore receive the support both of individuals and of the N.V.M.A.

In conclusion, I should like to pay tribute to the fairness of the R.C.V.S. examinations, particularly the orals conducted by veterinary practitioners in the finals. There are plenty of people only too willing to criticise the profession to serve their own ends. If "1944 graduate" tries to see a little of the good in his own profession, is not blind to defects in others; and at the same time works to raise our standard of knowledge, he will do more good than if he continues to indulge in ill-founded criticism.

Yours faithfully,

May 7th, 1945. "1939 Graduate."

* "Huxley," by MacBride, London, 1934.

. . . . .

Sir,—Mr. W. H. Carr's efforts to defend his action as a signatory to the memorandum in question were those of a guilty man, and I would say to him, "If the cap fits, wear it."

Yours faithfully,

St. Austell, Cornwall. Robert S. Townson.
May 14th, 1945.

Sir,—As one who signed the much criticised memorandum, I desire to record that I am in agreement with the letter forwarded by the R.C.V.S. to the Ministry of Agriculture. In my opinion it should meet with the approval of all but a few Diehards.

Yours faithfully,

"Yondercott," Taunton, Somerset. J. Fox.
May 19th, 1945.

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ECHINOCOCCOSIS

Sir,—In response to Mr. McCleery's letter appearing in *The Veterinary Record*, No. 17, Vol. 57, 206, I wish to mention the following case seen on January 29th, 1945:—

Ante-Mortem Examination.—The animal was one of many and not identified. It had come from the Leominster district.

Post-Mortem Examination.—Carcase of an aged cow in poor condition. Numerous echinococcus cysts were found in the lungs and spleen. The liver was one mass of cysts varying in size, the largest about that of a goose egg. The only liver parenchyma to be seen took the form of little islets between the cysts. The liver had retained its normal outline but no dimensions were taken. It weighed 120 lb.

No evidence of peritonitis was noted and judging from the cases seen, this would not appear to be a constant feature. The body was seized as unfit for food due to general oedema.

Rumour has it that an "echino." liver weighing 169 lb. has been seen here some years ago, but no authentic record is available.

It will be readily admitted that such livers are pathological curiosities.

Any notes on the incidence of acetone and other abnormal odours in home-killed meat would be appreciated.

Yours faithfully,

7, St. Martin's Lane, Birmingham. Kerry O'Sullivan.
April 10th, 1945.

* * * * *

RABIES

Sir,—It may interest some of your readers to hear that a native cure for rabies in Nigeria is the hair of the dog that bit you.

If a rabid dog has bitten anyone it is killed and skinned; the hair and skin are then macerated in water and drunk by the persons bitten.

I wonder if the well-known expression "the hair of the dog that bit you" (which I am informed is now used largely as an excuse for another drink to put one right in the morning) had its origin in a similar remedy for rabies known to our forefathers?

Yours faithfully,

G. M. Gates,
Veterinary Officer, Adamawa Province, Nigeria.

Westbury, Arundel, Sussex.
March 23rd, 1945.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
Apr. 16th to Apr. 30, 1945...	6	10	1	4	44
Corresponding period in—					
1944 ...	11	—	—	—	33
1943 ...	10	—	—	2	20
1942 ...	19	—	—	7	18
Total Jan. 1st to Apr. 30, 1945	43	73	5	37	375
Corresponding period in—					
1944 ...	86	19	5	58	214
1943 ...	118	10	5	94	188
1942 ...	114	11	26	105	141

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at April 30th, 1945, was as follows:—

England	Wales	Scotland	Total (Great Britain)
4,637	8,554	4,681	17,872